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PHOENIX COMMAND™

Small Arms Combat System

LEADING EDGE
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PHOENIX COMMAND™

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GAMES

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Introduction

The **Phoenix Command Small Arms Combat System** has been designed to blend a very accurate simulation of man-to-man combat with a fast, straightforward set of rules. The mechanics of fire and movement, the capabilities of a wide range of modern weapons, and the effects of injuries are all accurately presented, using simple systems and easy-to-read tables. It is of equal value to the student of the military, the wargamer interested in man-to-man gaming, and the role-player who desires greater realism than is possible with most game systems.

To get started, players should read Chapter One, which explains the Character and the terms used in **Phoenix Command**, and Chapter Two, which presents the rules to the Basic Game. After a few combats using the Basic Game, players can add in the various Advanced and Optional Rules at their discretion.

A quick note about dice for anyone who may be unfamiliar with the conventions used in this book; at least three six-sided dice and one or more ten-sided dice (available in hobby stores) are needed to play. The ten-sided dice are mostly used to generate numbers from 0 to 99. Simply roll a die twice; the first roll is the tens digit, and the second represents the ones. Thus, a roll of 6 and 2 would be 62, and a 0 and a 9 would be 09.

Incidentally, this is the third edition of **Phoenix Command**, and the fourth printing. Most of the changes which have been made are minor, and what editing has been done is more in the nature of tinkering than actual redesign. Owners of earlier editions will not find major discrepancies; a list of significant changes has been included in Chapter Four.

We are confident that players in search of excitement and realism will continue to be as satisfied with the new **Phoenix Command** as they were with the earlier editions. Enjoy the game, with our best wishes.

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1 THE CHARACTER

Welcome to **Phoenix Command**. For those unfamiliar with role-playing games or wargames, **Phoenix Command** is an excellent introduction to the fascinating world of simulation gaming. Just as chess represents a strategic game of conquest and strategy, **Phoenix Command** details the action in modern small arms combat. Like chess, playing pieces moved on a playing surface resolve the action. But unlike chess, the playing pieces in **Phoenix Command** represent individual people, or characters, with combat resolved on a second by second basis. The outcome depends on each character's actions, skill, and strategy. Any number of people can play **Phoenix Command**; it is ideally suited to two teams, with a referee to moderate the action.

1.1

USING THE GAME

Phoenix Command is a small arms combat system. It has been designed for use as a stand-alone game or as a combat system for any other game. Its self contained rules may be used to accurately recreate combat scenarios from books, movies, current events, or history. All that is needed are pencil and paper, six- and ten-sided dice (available at local game stores), and either scale models, hex maps (also available at game stores) or a large piece of paper. The models, maps or paper are used as the game surface. On it the terrain, buildings, and the basic setting in which game play will take place are established. This might be a deserted village, a jungle, or a city street. Once the playing surface has been set, playersdivide up the people, or characters, whose actions will be represented on the playing surface. These characters are the playing pieces, and like chess pieces they are represented by figures, markers, or any other agreed upon device. Each player is responsible for the actions of each of his characters, guiding them through play. **Phoenix Command** provides the system of movement and combat which regulates the interactions between characters, accurately simulating the results of the conflict.

1.2

CHARACTERISTICS

Each character or combatant has certain innate characteristics which help to determine performance on the battlefield. These **Characteristics** are defined by numbers which represent the character's physical and mental capabilities; Strength, Intelligence, Will, Health, and Agility. Other characteristics which are specific to role-playing are not dealt with here, as they do not directly affect combat.

Figure 1 is a sample **Status Sheet** for a character. The five Characteristics are located in its upper left column. Definitions of the Characteristics are as follows and a blank Status Sheet is at the back of this book.

Name: Trent **Skill Level:** 8

Characteristics

Strength	STR	16
Intelligence	INT	13
Will	WIL	12
Health	HLT	12
Agility	AGI	10
Base Speed		3
Maximum Speed	MS	6
Skill Accuracy Level	SAL	14
INT Skill Factor	ISF	27
Combat Actions	CA	8

Combat Actions per Impulse

Impulse	1	2	3	4
Actions	2	2	2	2

Knockout Value KV 48

Body Armor **Protection Factor** **Weight**

Helm:	—	
Visor:	—	
Body:	—	
Limbs:	—	

Equipment

M16 Rifle	8.0
2 Magazines	2.0
Magazine Pouch	.2
Fighting Harness	.6
Clothing	5.0

Encumbrance = 15.8

"How do you expect me to fight with this helmet on? And this ammo weighs a ton!"

Humbert NoDose

Weapon Data:

Reload Time	RT	8
Rate of Fire	ROF	*7
Ammunition Capacity	Cap	30
Ammunition Weight	AW	1.0
Penetration	PEN	17
Damage Class	DC	6

Aim Time	Aim Time Mod	Shot Accuracy
1	-22	-8
2	-12	+2
3	-9	+5
4	-7	+7
5	-6	+8
6	-5	+9
7	-4	+10
8	-3	+11
10	-1	+13
12	0	+14

Figure 1 Sample Status Sheet

Strength (STR): The overall physical strength of the character. An untrained character with STR 10 can dead lift about 200 pounds, one with STR 14 can dead lift about 250 pounds, and one with STR 18 can dead lift about 400 pounds.

Intelligence (INT): Mental dexterity influencing the speed with which the character can make decisions. As such it is a factor in determining overall combat effectiveness.

Will (WIL): Resolve and willpower, affecting courage in the face of danger and resistance to the pain of wounds.

Health (HLT): Physical health and the ability to recover from wounds.

Agility (AGI): Physical coordination and speed.

The value of each Characteristic will typically be between 3 and 18. The larger the value, the greater the character's capability, as indicated on the following table.

Characteristic	Description
18	Exceptional
16	Excellent
14	Good
12	Above Average
10	Average
8	Below Average
6	Poor
3	Extremely Poor

To use this system with another game, convert the other game's characteristics to the 3 to 18 scale, using the preceding guidelines. For a stand-alone game, simply determine the value of each characteristic by summing the roll of three six-sided dice. Alternatively, the pregenerated troop data of Section 1.5 can be used for quick pick-up games, or to provide opponents for scenarios.

1.3 GENERATING A CHARACTER

To generate a character, determine each value on the Status Sheet using the following step-by-step procedure. General explanations of these values are given here; the full details are found in the chapters that follow. A blank Status Sheet has been provided at the end of this book, while **Figure 1** is an example of a completed sheet.

Step 1 Characteristics

Separately determine the values of each of the characteristics found in the upper left-hand corner of the Status Sheet by summing the roll of three six-sided dice.

Each Characteristic = Total of three six-sided dice

Step 2 Skill Level

The character's ability is represented by his **Gun Combat Skill Level**. This should now be established using the following guidelines.

Skill Levels range from 0 to 20, with Level 0 being someone with no training whatsoever. An average soldier in an average army is assumed to be 3rd to 4th Skill Level, while highly trained elite troops are 5th to 7th. Outstanding members of elite units might be 9th to 12th, and only truly exceptional people would be of higher level. 20th Skill Level is the maximum possible.

Those of you who are using other role-playing games will have your own way of generating Skill Levels, and acquiring experience or training. Simply adjust that system to this scale for determining your Skill Levels.

Player or Referee chooses the Gun Combat Skill Level

Step 3 Encumbrance

Now the **Encumbrance** is determined. This is the total weight of armor, clothing, weapons, and equipment carried into combat. The greater the Encumbrance, the slower the character. Backpacks and other non-combat equipment can sometimes be dropped

before entering combat; if so, they should not be included in this weight. The setting of the game will determine whether this occurs or not.

To find the Encumbrance of a character, simply total the weights (in pounds) of all equipment being carried. A discussion of weapons and equipment may be found in Section 1.4, and in the **Weapon Data Tables** at the back of this book.

The Weapon Data Tables are divided into seven sections; Pistols, Sub-Machineguns, Assault Rifles, Machine Guns, Shotguns, Direct Fire Explosive Weapons, and Grenades. Select the character's weapon or weapons from the Weapon Data Tables, and record on the Status Sheet their weights, and those of all armor, ammunition, and equipment carried on the Status Sheet. If armor is being worn, record its **Armor Protection Factor (PF)** in the space provided (see Section 1.4).

Record equipment weights and Armor Protection Factors
Encumbrance = Total weight carried into combat

"One for all,
And all for one,
If he's out of arms reach,
Then go for your gun."

The King's Musketeers

Step 4 Base and Maximum Speed

Next find the character's **Base** and **Maximum Speeds**. These depend on his Strength, Agility, and Encumbrance. Base Speed represents overall mobility, while Maximum Speed is the character's top running speed.

Find the Base Speed by cross-indexing the Strength (STR) characteristic (Step 1) with the Encumbrance (Step 3), on the **Base Speed Table (1A)**. Record the Base Speed on the Status Sheet. As an example, a character with STR 16 and an Encumbrance of 15 pounds has a Base Speed of 3.0. Encumbrance should be rounded off to the nearest column.

Now cross-index the Base Speed with the character's Agility (AGI) characteristic (Step 1) on the **Maximum Speed Table (1B)**, to find the Maximum Speed (MS). For example, a character with AGI 10 and a Base Speed of 3.0 has a Maximum Speed of 6.

In this way, the character's strength and quickness are factored in with the weight he is carrying, to determine how quickly and easily he can move.

Base Speed = Cross-index Strength (Step 1) and Encumbrance (Step 3) on Table 1A
Maximum Speed = Cross-index Agility (Step 1) and Base Speed on Table 1B

Step 5 Skill Accuracy Level

The character's **Skill Accuracy Level (SAL)** is now determined. This measures his skill with weapons, and obviously has a significant effect on how accurate his shots will be. The greater the SAL, the greater his expertise. It is found opposite the Gun Combat Skill Level on **Table 1C**, and should be recorded on the Status Sheet. Note that there is a rapid increase in the SAL as a character moves through the low levels. This is because of the very rapid improvement in ability which comes from even a little training or practice.

"If you can't dazzle them with style, riddle them with bullets."

Corely Norris

Skill Accuracy Level found on Table 1C opposite the Gun Combat Skill Level (Step 2)

Step 6 Intelligence Skill Factor

Next the **Intelligence Skill Factor** is established. This is the sum of the Intelligence characteristic and the Skill Accuracy Level (Step 5). Record it on the Status Sheet. Intelligence in this sense does not represent learning, but general quickness of wit and reaction.

Intelligence Skill Factor = Intelligence (Step 1) + Skill Accuracy Level (Step 5)

Step 7 Combat Actions

The time required to perform any act, such as loading a weapon, opening a door, or walking through a room, is measured in **Actions**. Each Action is not a precise amount of time, but a relative representation of how long an act will take someone. Some people can do things more quickly than others; this is represented by allowing them to use more **Combat Actions** during each 2 second Phase, or one-half second Impulse.

To find the Combat Actions, go to the **Combat Actions Table (1D)** and cross-index the character's Maximum Speed (MS) of Step 4 and his Intelligence Skill Factor (ISF) of Step 6. Record his Combat Actions on the Status Sheet.

Each game **Phase** is divided into four **Impulses**, and a character's Combat Actions are naturally divided up on that level as well. The **Combat Actions Per Impulse Table (1E)** gives the number of Actions a character may perform in each of the four Impulses. Just go across the line for the character's number of Combat Actions, and record each of the four numbers in the appropriate spaces on your Status Sheet. These four numbers added together will equal your character's Combat Actions.

Combat Actions = Cross-index Maximum Speed (Step 4) and Intelligence Skill Factor (Step 6) on Table 1D

Combat ActionsPer Impulse = Found opposite the Combat Actions (above) on Table 1E

"A Bullet in the arm Does very little harm. A bullet in the head Can make you very dead."

Fred the Singing Bandit

Step 8 Knockout Value

Phoenix Command uses a system of shock and Physical Damage to determine how a character is affected by wounds. A key factor in this system is each character's **Knockout Value (KV)**. This number is used to determine at what point the character goes into shock from his injuries. The larger the Knockout Value, the greater the ability to ignore the pain of wounds. The Knockout Value is one half of the Will characteristic times the Gun Combat Skill Level (rounded off).

Knockout Value = .5 x Will (Step 1) x Gun Combat Skill Level (Step 2)

Step 9 Weapon Data

A wide-ranging list of weapons is found in the **Weapon Data Tables** located at the back of this book. The appropriate data for the weapon used by a character should be transferred from the Weapon Data Tables to the Status Sheet. For those just starting out, this is certainly not necessary during character generation. It is, however, a good idea to copy the numbers at some point, as the information will be used in combat.

Much of the data in the Weapon Data Tables is not used in the Basic Game of Chapter 2. Many values are used only in the Advanced Rules of Chapter 3 and the Optional Rules of Chapter 5, while some are used only in the **Advanced Phoenix Command Combat Supplement**. The following discusses the values contained on the Weapon Data Tables. Those playing the Basic Game may ignore those used in the Advanced or Optional Rules.

Length (L): Overall weapon length in inches. If two numbers are shown separated by a slash (/), the first number is the weapon's length with the stock folded, while the second is its overall deployed length.

Weight (W): The loaded weapon weight in pounds. It does not include a holster or sling.

Reload Time (RT): The time, in Action Counts, required to fully reload the weapon.

Rate of Fire (ROF): The time, in Action Counts, required to chamber a round from the weapon's magazine.

An asterisk (*) indicates a self-loading action in which a round is chambered automatically after each shot fired. With this type of weapon, a round is always ready for fire until the magazine is empty.

A number following an * indicates the weapon is capable of fully automatic fire and gives the number of rounds fired per half second burst.

Weapons with no ROF entry have no magazine; the time required to prepare a shot is given by the Reload Time (RT).

Blam. Blam.
"Stop." Blam.
"Police." Blam.

Officer Axly

Ammunition Capacity (Cap): The maximum number of rounds which can be held in the weapon's magazine.

Ammunition Weight (AW) and Feed Device: The weight in pounds per belt (Blt), drum (Drm), magazine (Mag), or individual round (Rnd).

Knock Down (KD): Measure of the weapon's knock down capability. This has nothing to do with physical damage or incapacitation but can be used to determine if the projectile's momentum knocks the target off his feet or off balance. This is discussed in the Optional Rules of Chapter 5.

Sustained Automatic Burst (SAB): The measure of the weapon's recoil and its accuracy during long bursts of automatic fire. This is used in the Advanced Automatic Fire rules of Chapter 3.

Aim Time Modifiers (Aim Time Mod): The combined measure of the weapon's accuracy and speed of aim. There are several **Aim Time Modifiers**, one for each **Aim Time** listed in the third column. How accurate a shot is obviously has a lot to do with how much time has been spent aiming. The Aim Time Modifiers measure this. As a character devotes more Actions to his Aim Time on a given shot, his accuracy improves. The greater the Aim Time Mod, the greater the accuracy.

Each weapon's listing contains Aim Time Mods for several Aim Times. These Aim Times typically range from 1 to 12 Actions. The Aim Time Mod to the right of each Aim Time measures the weapon's inherent accuracy and speed of aim.

A close look at these numbers will show that small weapons, such as pistols, are more accurate for brief aim times, but do not improve much with long aim, while longer rifle-type weapons are the opposite. This is obviously because light, short pistols can be aimed quickly, but have short barrels and lack real accuracy. Rifles, on the other hand, take longer to move around, but if aimed carefully can be extremely accurate.

The Aim Time Mods are important factors in shot accuracy, of course, and affect the Odds of Hitting of every shot fired.

These Aim Time Mods should be added to the character's **Skill Accuracy Level**, which measures the shooter's accuracy, to determine the overall **Shot Accuracy (SA)**. Just add the Skill Accuracy Level (SAL) to each of the weapon's Aim Time Mods, and record the totals under Shot Accuracy on the Status Sheet. The Weapon Data section of **Figure 1** shows both sets of data, the Aim Time Mods from the **Weapon Data Tables**, and the Shot Accuracy values after the SAL has been added in.

Shot Accuracy = Aim Time Mod (Weapon Data Table) + SAL (Step 5)

Penetration (PEN) and Damage Class (DC): PEN measures bullet penetrating power, and DC measures bullet damage capability. The greater the PEN and DC, the greater the penetration and damage. The PEN and DC are given for target ranges 10, 20, 40, 70, 100, 200, 300, and 400 hexes. A hex is 2 yards across and **in the Basic Game of Chapter 2, only the 10 hex range values need be recorded**. There are three sets of PEN and DC values. Each set represents a different type of ammunition as given to the left of these values: Armor Piercing (AP), Full Metal Jacket (FMJ), High Explosive (HE), High Explosive Anti-Tank (HEAT), and Jacketed Hollow Point (JHP).

Players not using the **Advanced Phoenix Command Combat Supplement** should not use weapon data from the shaded portions of the tables. This data represents performance beyond the weapon's **Effective Range** and is used only in the **Advanced Phoenix Command Combat Supplement.**

Minimum Arc (MA): The minimum number of hexes over which a burst of fully automatic weapon fire must be spread. The greater the weapon's recoil, the greater the Minimum Arc. This value is used only in the Advanced Rules of Chapter 3.

Ballistic Accuracy (BA): The measure of weapon/ammunition accuracy potential. The larger the BA, the greater this potential. This value is used in the **Advanced Phoenix Command Combat Supplement.**

Time of Flight (TOF): The projectile's time of flight in tenths of seconds. This value is used in the **Advanced Phoenix Command Combat Supplement.**

Record Weapon Data from Weapon Data Table
Shot Accuracy = Aim Time Mod (Weapon Data Table) + SAL (Step 5)

The character is now ready for play. Use of the above values is detailed in Chapter 2: Basic Game: Movement and Combat.

1.4

EQUIPMENT AND ARMOR

This section gives the weight of combat equipment and body armor. Weapon data is provided in the **Weapon Data Tables** located at the back of the book. Weapon data has been divided into seven sections; Pistols, Sub-Machineguns, Rifles, Machine Guns, Shotguns, Explosive Direct Fire Weapons, and Grenades/Explosives. Within each section, the weapons have been separated by nationality. A brief discussion of the values on the tables is found in Step 9 of Section 1.3. Detailed use of those values is in Chapters 2, 3 and 5. The weights of some standard pieces of combat equipment are found in the following table. While this is by no means a complete list, it should fill the needs of most games. Players should feel free to expand the list as desired.

Equipment Table

Equipment	Weight
Bayonet	1.0
Binoculars	2.0
Bipod	1.0
Canteen (full)	2.5
Clothing	5.0
Entrenching Tool	1.5
Field Radio	12.0
Fighting Harness	.6
Headset Communication	1.0
Holster	.4
Magazine Pouch (2 Mags)	.2
Optical Scope	2.5
Sling	.4
Smoke Grenade	1.0

The weight, **Protection Factors (PF)**, and coverage of common body armor has been included in the following table. The larger the armor's PF, the greater the protection. If the weapon's Penetration value (PEN) is less than or equal to the armor's Protection Factor (PF), the armor will stop the projectile. Body armor has been divided into head, visor, and body coverage and is worn over normal clothing. The BPF value is used only in the **Advanced Phoenix Command Combat Supplement** and is the **Blunt Protection Factor.**

Armor Table

Armor / Clothing	PF	BPF	Armor Weights Head	Visor	Body
Clothing	0	0	-	-	5.0
Light Flexible Armor	4	1	-	-	2.0
Medium Flexible Armor	6	2	-	-	2.6
Heavy Flexible Armor	9	3	-	-	3.2
Light Rigid*	6	4	2.2	.8	7.9
Rigid*	10	4	3.1	.8	11.5
Medium Rigid*	16	5	4.0	.8	15.0
Heavy Rigid	30	6	-	-	24.0

* Visor PF = 4

1.5 PREGENERATED TROOPS

This section provides pregenerated troop data for players to use as characters or for opponents in scenarios. The following table provides all the values required for play except weapon data which is found on the **Weapon Data Tables** at the back of this book.

To prepare a combatant, take a blank **Status Sheet** like the one at the back of this book, and record the Skill Level, Combat Actions, Armor PF, Knockout Value, and Skill Accuracy Level given below.

Pregenerated Troop Table

Troops	Skill Level	Combat Actions	Helm PF	Body PF	Knockout Value	Skill Acc Level
Untrained	0	3	-	-	5	0
Militia	1	4	-	-	5	5
Green	2	4	-	-	10	7
Line	4	4	-	-	20	10
Crack	5	6	-	-	35	11
Elite	7	6	-	-	56	13
Line	4	3	16	30	20	10
Crack	5	4	16	30	35	11
Elite	7	4	16	30	56	13

Now, pick a weapon from the **Weapon Data Tables** and fill in the Weapon Data section of the Status Sheet. Add the Skill Accuracy Level to each of the Aim Time Mods and record the sums (the Shot Accuracy) on the Status Sheet. The combatant is now ready for play.

2 BASIC GAME: MOVEMENT AND COMBAT

The **Phoenix Command Combat System** has been designed to be both intense and realistic. It is designed to simulate real combat as accurately as possible. This means that battle is very dangerous, and that bullets are as deadly to a veteran as they are to a new recruit. After their initial experiences, it is likely that characters will learn that combat is not a thing to be entered lightly.

The **Basic Combat** rules are designed to introduce the various concepts involved, in simple and direct ways. As players learn the basic system, and should they desire more detail in their play, the various Optional rules can be added in. Each group of players should feel free to use the rules with which they are comfortable; the game has been designed to allow a high degree of realism, but that is certainly not necessary for a very enjoyable experience.

2.1 GAME SCALE AND PLAYING SURFACE

As mentioned during Character Generation, the **Phoenix Command** combat system uses **Phases** which are 2 seconds long. Each Phase is divided into a series of 4 **Impulses**, in which all movement and fire are executed simultaneously. For a playing surface, either a table top or a hex map may be used, with each **Inch** or **Hex** representing 2 yards. Each combatant should be represented on the playing surface by a miniature figure, a counter, or other agreed-upon marker.

Players should be set up on the playing surface whenever combat is imminent. The Referee should simply draw the outlines of buildings and other terrain features, such as trees and ridge lines, directly on the surface. A variety of blank, erasable hex maps are currently available in hobby and gaming stores, and are ideal for this purpose. If the players are using a table top, then butcher paper or something similar can easily be substituted. As much detail as desired may be included, and the Referee should be careful to draw all features to scale. Models of buildings, when available, are of course ideal. When the map is ready, then the characters are placed in their locations, along with whatever opponents or other people they can see.

2.2 PHASES AND COMBAT ACTIONS

As stated above, each **Phase** consists of four **Impulses**. Since a Phase is two seconds long, each Impulse is one-half of a second. During each Impulse, every combatant is able to perform a certain number of **Combat Actions**, as shown in the **Actions Per Impulse** portion of the Status Sheet (Section 1.3, Step 7). For example, a character with 4 Combat

Actions may perform one Action in each Impulse, while someone with 6 Actions may perform 2 in the first and third Impulse, and 1 each in the second and fourth. A character does not have to use all his Actions in each Impulse, or each Phase, but those which are not used are simply lost; they may not be saved from Impulse to Impulse.

The **Action Time Table** on the **Status Sheet** gives the Action costs for many typical actions. As an example, movement in a running stance costs 1 Action per hex, and assuming a firing stance costs 2 Actions. The Referee may determine the cost of any unlisted action using his own judgement. The Action cost should be equal to two times the time (in seconds) it would take an average man to perform the act. For example, an activity which takes an average man 3 seconds to perform would cost 2 X 3 = 6 Actions.

Anything listed on the Action Time Table may be performed by any combatant; it just takes some people longer than others. If a player is attempting to do something which takes more than a single Impulse, or which would extend into the next Phase, then he simply applies whatever Actions he has to the activity, and continues applying them each Impulse until he has enough. When he has 'spent' enough Actions, then he can perform the act. Players should write down their accumulation of Combat Actions when doing this; small hash marks are sufficient.

For example, consider the character Trent, from the sample Status Sheet on page 3. Trent has 8 Combat Actions; this is 2 Actions per Impulse. It is the beginning of a Phase, and he wants to take 6 Actions of aim before he fires. He aims, at 2 Actions per Impulse, through the first two Impulses, and fires at the end of the third. If he had begun aiming in the third Impulse of one Phase, then he would have fired at the end of the first Impulse of the next Phase. (2 Actions in Impulse Three, and 2 more in Impulse Four for a total of 4 Actions. A new Phase would then begin, and Trent would use his 2 Actions during Impulse One to bring his total to 6.)

Actions can be mixed, as long as they are not exclusive. This means that a player can aim while moving, but cannot aim at two different targets at once, or any other obvious contradiction. It is also difficult to **aim while moving**; a character may only use a maximum of 1 Impulse worth of aim if he is moving.

In Trent's case, he might choose to move forward one hex (using 1 Action per hex), and take 1 Action of aim as well, in each Impulse. After 2 Impulses, he would have moved through two hexes and would have 2 Actions of aim. If he wanted his shot to be more carefully aimed than that, he would have to stop moving.

It should be noted that combatants can change their minds. A player who intends to aim for 6 Actions may decide instead to shoot after only 5 (or 4, or 7, or any other number). The target may also move out of visibility (Section 2.4) before the player wishes to fire. In this case the player must shoot as the target leaves visibility, using whatever Actions of aim he has at that point, or the time spent aiming is simply wasted, and the combatant receives nothing for the Actions he has used.

"There is no such thing as excessive violence."

Gil the Treacherous

2.3

FACING AND MOVEMENT

The figure or marker representing each character is always oriented in a specific direction; this determines where he can move and fire, and is called the character's **Facing**. Facing may be in any direction and is not limited by the hex grid. Hexes are only used to regulate movement distance.

The character's Facing determines his **Field of Fire** and **Field of View**. The Field of Fire is the area into which he can fire his weapon; this is a 60 degree cone centered on his Facing. The Field of View is the area he can immediately see; the front 180 degrees, centered on his facing. If the game is being played on a table top or other unmarked surface, the Fields of Fire and View are estimated by the Referee. Note that when a character is in a Firing Stance, his Field of View is also 60 degrees.

The Action Time Table mentions the Action costs for **Changing Facing**; it should be noted that small turns made while moving are free. For each hex entered, a combatant may change facing up to 60 degrees (one hexside) without CA cost. There is only a CA cost for turning if the combatant is not moving that Impulse, or if he wishes to turn more than one hexside per hex.

Example:

At the start of play, Trent (8 CA) is behind the cover of a tree, and wants to move 11 hexes forward to a low wall. In Phase 1, he moves 3 hexes forward, changes facing 1 hexside, and continues on 5 more hexes. This uses a total of 8 Actions. In Phase 2, he continues moving forward 3 more hexes and reaches the wall. He stops, and changes facing 3 hexsides to face back the way he came. This uses a total of 4 Actions (3 for moving, a free hexside turn in the last hex, and 1 Action for 2 more hexsides), meaning that Trent has completed his movement at the end of Impulse 2 of Phase 2. He has 2 more Impulses, and therefore 4 more Actions, available before the Phase ends.

2.4

FIRE

There are several factors which affect the accuracy of a shot. The skill of the shooter, the basic accuracy of the gun itself, the amount of effort spent aiming, and the range are obviously all very important.

Each is considered when determining the chance of hitting a target. The **shooter's skill** is represented by the **SAL**, and the **Range** is determined by counting the number of hexes or inches between the shooter and the target.

The weapon's inherent accuracy and the amount of time spent aiming are covered by the **Aim Time Mods** from the **Weapon Data Tables**. A shot using 1 Action is the quickest, and is usually called a Snap Shot. A shot using the maximum number of Actions shown in the Aim Time Mods column is the most accurate possible for that weapon. Note that the **act of firing** is included in the Aim Time; a Snap Shot uses one Action for aiming and firing, and does not require 1 Action for aim and another to pull the trigger.

These factors are all included in the **Odds of Hitting Table (2)**. The left column is labelled **Shot Accuracy (SA)**; this is equal to the Aim Time Modifier of the weapon used at the number of Actions of aim which the shooter has applied, plus the shooter's **Skill Accuracy Level** (Section 1.3, Step 5). If the Shot Accuracy falls between two values, use the lower number. On Trent's Status Sheet (Figure 1), with 4 Actions of aim, his Shot Accuracy is +7.

The SA is then cross-indexed with the Range to the target, in either hexes or inches, to determine the **Odds of Hitting**. Enter the Range column with the first number that is equal to or greater than the actual range. If, as mentioned above, Trent has a Shot Accuracy of 7, then he would have a 86% chance of hitting a target that was 8 to 10 hexes away.

Target Visibility

Naturally, a character has to be able to see a target to shoot at it. A direct line of sight system is used for target visibility and spotting. All exposed targets within a character's Field of View are visible from the beginning of the Impulse they begin an action which exposes them, until the end of the Impulse in which they go into concealment. In other words, if a character steps out around a corner (which takes 1 Action) on Impulse One, fires on Impulse Two, and ducks back around the corner on Impulse Three, he is visible from the beginning of Impulse One to the end of Impulse Three.

OPTIONAL MODIFIERS

There is far more to the chance of hitting than the factors mentioned above; some of these other factors are covered on the **Optional Accuracy Modifiers Table (2C)**. If desired, any or all modifiers which apply are added to (or subtracted from) the Shot Accuracy, before determining the Odds of Hitting.

As an example, return to Trent's shot with an SA of 7 and a 86% chance of hitting. If his target were moving, he would subtract 5 from his Shot Accuracy. This would give him a new SA of 7 - 5 = 2. He would now need to roll a 53 or less to hit a target at Range 10. If the target was also running in the open (Standing Exposed), however, Trent would add 8 to the SA, bringing it up to 10, and a 96% chance.

Positions and Stances

There are three possible positions; **Standing, Kneeling**, and **Prone**. Each of these has a different Shot Accuracy Modifier, as indicated on **Table 2C**. From a Standing position, it costs 1 Action to Kneel, and 2 to go Prone. From Kneeling, it costs 1 to either Stand or go Prone. When Prone, it costs 2 to Kneel, and 3 to Stand up.

There are also two Stances used in determining Shot Accuracy. If no preparation is made before a combatant begins aiming, he is said to be **Firing From The Hip**, and suffers a -6 penalty to his Shot Accuracy. If he uses 2 Actions to assume a proper firing position, called a **Firing Stance,** then his aim uses the normal Odds of Hitting. The Aim Time begins after the combatant assumes the Firing Stance. Once in a Firing Stance, the character continues to receive the Firing Stance advantages until he moves.

Ducking

Ducking is a defensive option available to all combatants whenever they are fired upon. Ducking costs no Actions, and a Duck may be performed during the same Impulse as any other activity, including firing. All shots fired at someone who Ducks are at **-5 Shot Accuracy**, and if the person Ducking fires at the same time, he would execute his fire with a **-10 Shot Accuracy** modifier. Note that Ducking interrupts any action which was being performed.

Automatic Fire

Most of the weapons used in the game are capable of **Automatic Fire**. When a weapon is set on Automatic, it fires a one-half second burst each time the trigger is squeezed, instead of just a single round. Weapons which can do this are those which have an asterisk(*) preceding their Rate of Fire (ROF) value on the Weapon Data Table.

When using Automatic Fire, only one burst may be fired per Impulse, and therefore a maximum of four bursts may be fired per Phase. This is in contrast to single shot firing, where the maximum number of shots which can be fired in an Impulse or Phase is limited only by the number of Combat Actions. On the other hand, all Automatic Fire receives the **+1 Action Aim Time** bonus shown on **Table 2C**. It also uses the **Automatic Fire Table (2B)** to determine how many rounds hit the target. This table works in the following way.

"Dispose of them discreetly, Demolish them completely."

Fred the Singing Bandit

To use Automatic Fire, determine the Odds of Hitting normally, making sure to include the +1 Aim Time modifier for Automatic Fire. Roll to see if the shooter hits; if he does, then it means that the rounds are in the correct area, and at the right elevation. Now go to **Table 2B.** Find the appropriate Range, and cross-index it with the **Rate of Fire** of the weapon. This gives the number of rounds which have hit the target.

It is also possible to hit more than one target with a burst of Automatic Fire. At ranges of 45 hexes or less, the shooter may choose to sweep his fire across a full hex. If this happens and a hit is scored, every person in the target hex is hit. Use the 45 Hex range entry on **Table 2B** to determine the number of hits scored on each target.

Target Size

Combatants who are in doorways, behind walls, and in similar situations are harder to hit than those who are standing in the open. The **Target Size Modifiers** deal with these situations.

There are five entries in this portion of the table. **Looking Around Cover** is for targets who are just looking over or around cover, and are exposing only their heads. **Firing Around Cover** is for when the target is behind cover and returning fire, or preparing to; the shooter can see the head, shoulders, and arms. **Standing**, **Kneeling**, and **Prone Exposed** are all self-explanatory.

In addition to the Odds of Hitting modifiers, targets which are Looking Over or Firing Around Cover can only be hit in certain body locations. This is handled by using the **Firing Around Cover Hit Location Table**, and is discussed in Section 2.6.

2.6

HIT LOCATION AND DAMAGE

Whenever a target is hit, the **Hit Location and Damage Table (3A)** is used. This table breaks the body down into its significant areas, or Hit Locations, depending on how vital they are to survival. It shows the appropriate injury caused by the shot, based on the weapon's effective Damage Class. The various factors on the Table are discussed below.

Target Position

There are two columns of Target Positions, labelled **Firing Around Cover** and **In The Open**. The Open column is used for targets who are largely or entirely visible to the shooter, and includes all possible Hit Locations from Head to Foot.

The Firing column is used for targets who are mostly concealed. As discussed in Section 2.5, only certain Hit Locations can be hit on people who are under cover. The Firing column includes only the head, shoulders, and arms as possible hit areas. To accurately simulate hits to targets who are **Looking Over Cover**, ignore all rolls on this Hit Location Table over 22.

Hit Location

This section of the table is simply a list of the various body areas which can be hit. Glance hits are assumed to cut across the target shallowly, and usually ricochet off bone .

Having selected the correct Target Position column, the firing player rolls a 00-99 number to determine the Hit Location.

Example: Trent has hit an opponent who is firing over a wall. Trent will therefore use the Firing Around Cover column. He rolls a 62, which is the Shoulder location. If his opponent had been In The Open (largely visible to Trent) then this same roll would have resulted in a hit to the Thigh - Flesh area.

Penetration Line

Once the Hit Location has been determined, the question is whether the shot has penetrated the target's armor. Some shots will strike cleanly, while others partially or completely glance off. (See Glancing Roll, below.) This will obviously have a major effect on the damage done. The relative protection afforded by armor is accounted for by using the 4 **Weapon Penetration Lines** at the top of the **Hit Location and Damage Table (3A)**.

To determine which line should be used for a given shot, the weapon's **Penetration** is compared to the Armor's **Protection Factor (PF)** on the **Penetration Line Summary (3B)**. The table gives the minimum weapon Penetration values necessary for various degrees of effectiveness against different PF's. As an example, if the target's PF is 2 in the Location that has been hit, then a shot with a Penetration of 3 would use Weapon Penetration Line 1, a Penetration of 4 or 5 would use Line 2, Penetration 6 would use Line 3, and Penetration of 7 or higher would use Line 4. Obviously a shot with Penetration of 2 or less would fail to penetrate the armor.

Example: Trent is firing an M16 rifle, using FMJ ammunition. His Penetration is therefore 17. The target is wearing Medium Rigid body armor, with a PF of 16. When Trent's shot hits the target's Shoulder, we check the Penetration Line Summary; shots with a Penetration of 17 to 22 use Weapon Penetration Line 1. If Trent's Penetration were 23, then his shot would use Line 2. If the target were wearing Light Flexible body armor, on the other hand, with a PF of 4, his Penetration of 17 would use Line 4.

Glancing Roll

As mentioned above, the protection afforded by armor is not determined simply by its thickness. An important factor is its ability to deflect fire, by the use of slope, layering, or even reactive or reflective shielding. In these ways, well-designed armor can often preserve the life of its wearer from even high-powered weapons.

This is reflected by the use of the **Glancing Roll**, shown at the top of the **Hit Location and Damage Table (3A)**. For each shot that hits a target, a 0-9 number is rolled. This number is entered on the appropriate Weapon Penetration Line to determine the effect of the shot. If the number rolled is less than the lowest number in the Low Velocity Damage column, then the shot glanced off the armor; no damage is done. Otherwise, the number rolled determines which of the two sections of the Hit Location and Damage Table should be used; **Low Velocity Damage** or **Over Penetrating Damage**. These columns are discussed below.

"Don't think of it as being vastly outnumbered, think of it as having a very wide shot selection."

Generalissimo Puerco,
President for Life

Example: Trent's shot is using Line 1. This means that he must roll a 9 on his 0-9 die for the shot to cause Low Velocity Damage. If the number he rolls is less than 9, then no damage will be done. On the other hand, if he were on Line 4, then he would do Low Velocity Damage on a roll of 0, 1, or 2, and Over Penetrating damage on a roll of 3 or greater.

Resolving Damage

Now that the correct section of the Damage Table is known, the exact damage is determined. The severity of a wound is judged in terms of points of **Physical Damage (PD)**. The greater the PD, the more serious the wound and the greater the chance that the target has been incapacitated.

The PD value covers a very wide range, from 1 point to many thousands of points. These represent varying degrees of damage; rough descriptions are included in the Low Velocity Damage column. A scan down this column and the PD's associated with various Hit Locations will give the player some idea of what he is dealing with.

For example, a Low Velocity Damage hit to the Thigh - Flesh areas does 3 points of PD. This is in the general category of Superficial Wounds, and while somewhat painful, it is not an incapacitating wound to any but the most frail of people and is little threat to one's health. A Low Velocity wound to the Thigh - Bone, however, does a 16 PD Disabling Injury, while one to the Heart does a 4000 PD Critical Wound. The significance of PD is discussed in the next section.

The **Low Velocity Damage** column represents damage caused by shots which have been significantly slowed down by the target's armor. The damage from such shots is limited, and so the weapon's Damage Class is not considered. Just cross-index the Hit Location with this column to determine damage.

Over Penetrating Damage handles shots which have not been significantly slowed by armor. These shots are moving very rapidly, and can cause extensive rupturing of tissue in addition to the damage done in the path of the bullet itself. For these shots, choose the column which includes the weapon's **Damage Class**, and cross index it with the Hit Location.

Because the armor worn by a target is rarely the same for all Hit Locations, it is often necessary to roll the Hit Location before determining the Weapon Penetration Line and damage type.

Example: Trent's shot was to the Shoulder location. If the shot is doing Low Velocity Damage, then the target takes a 21 Physical Damage point Disabling Injury. If he were on the Over Penetrating Damage table, however, the Damage Class (DC) of his M16 would determine the damage. The DC of the M16 is 6; cross-indexing the Shoulder hit location with the Damage Class 6-8 column under Over Penetrating Damage, the damage is 1000 PD and a Double Disable result.

The first use of PD is to determine whether the combatant is disabled or incapacitated; this is covered in the next section. Even more important than that, however, the PD also determines the chance of a combatant surviving his wounds. This is discussed in depth in Section 2.9.

2.7

DISABLING INJURIES AND KNOCKOUT

There are two immediate side effects possible from a wound received in combat. It is possible that the victim will fall unconscious, slip into shock, or otherwise be unable to continue fighting. He might also be able to continue, but find that his abilities have been limited due to his injuries.

Being incapacitated is the first issue. Each Impulse in which a combatant takes one or more wounds, there is a chance that he will be unable to continue the battle. The following **Knockout Table** is used to determine the odds of this happening.

Compare the total amount of **Physical Damage (PD)** that the combatant has received to his **Knockout Value (KV)**, discussed in Section 1.3, Step 8. Select the appropriate line from the table, and read across to find the **Incapacitation Chance (IC)**.

A 00-99 number is then rolled, and if the number is less than the IC, then the combatant is out of the fight. If the number rolled is greater than or equal to the IC, then the combatant may continue, subject only to the Disabling Injuries rule discussed below.

"Join the army... Where every day could be your last."

Sgt. Ingram

Knockout Table

Total PD	Incapacitation Chance
less than 1/10 of KV	—
over 1/10 of KV	10
over KV	25
over 2 times KV	75
over 3 times KV	98

For example, Trent's KV is 48. If he took a wound of 4 points or less, he would not even have to check for knockout. From 5 to 48 points, he would have a 10% chance of being knocked out. 49 to 96 points gives a 25% chance, 97 to 144 is 75%, and 145 or more would mean incapacitation on any roll except 98 or 99.

Incapacitation must be **checked each Impulse** that a combatant takes damage, regardless of how much he takes. Also, the check is made against the total damage the combatant has received, not just the value of the latest wound. Thus, if Trent had taken 35 PD from previous wounds, and was hit again for 21 PD more, his total PD would be 56. This is more than his KV, and he would have to roll a 25 or better to remain active.

Note that a character who is **Incapacitated** is not necessarily unconscious. Some Incapacitated characters are simply scared and unable to continue to function (especially those with low KV's), while others are in extreme pain or have slipped into shock. Regardless, they are no longer considered effective in combat. The Optional Rules of Section 5.13 can be used to determine the exact condition of a character who has failed his Knockout roll.

Regaining Consciousness

The severity of a wound has a marked effect on how soon the victim can recover from shock, regain consciousness, or otherwise deal with the short-term incapacitation represented by a failed Knockout roll. This is handled through the use of the **Incapacitation Time Table (8B)**.

First choose the appropriate **PD Total** line. Round down if the character's PD Total is not shown; a PD Total of 49 uses the 0 PD line. Then roll a 0-9 number, and cross-index. This gives the time required to return to normal (or at least semi-normal) functioning. See Section 2.10 for combat capabilities following recovery.

Disabling Injuries

Disabling injuries are indicated on the tables with one or two asterisks (*). They are hits which have significantly damaged or broken the limb in question. These hits prevent the combatant from using the injured limb until it is fully healed. As noted on **Table 3A**, a single asterisk is a normal Disabling injury, while a double asterisk is required to Disable someone under the influence of pain deadening drugs.

A Disabled Leg means the character cannot move (in the Basic Game), and a Disabled Arm or Shoulder means that he cannot fire a weapon with that Arm. (These rules are slightly modified in the Advanced Rules; see **Table 7A**.)

2.8 TACTICAL NOTES

The **Phoenix Command Combat System** is somewhat different from most games, and naturally the tactics used in the game are also different. For this reason, a few very simple pieces of tactical advice are included below. Players may make of these what they will; based on playtesting, these points are sensible advice. They are not, however, rules of any sort, and talent, unusual situations, or luck may render any of them invalid in certain circumstances.

The most important advice sounds obvious, but it is very wise; try not to get shot. The longer you aim, the better your chance of hitting, but the longer you are exposed to enemy fire. Because of this, taking a Snap Shot and Ducking is often advisable.

Make use of cover, and try to get the drop on your opponent. Cover the corner or doorway you expect him to come around, and when he appears take a shot and duck. It is likely that during the Impulse he comes around the corner he will not have any more Combat Actions. Take your free shot and do not give him time for a good return shot.

Also, movement in a small arms battle is usually made up of quick darts from cover to cover. Unlike in the movies, combatants who stay out in the open take terrible, and often fatal, risks. Stay low, and do not step into open areas that your opponent can see.

One last point; teamwork is a key factor. Do not attack a prepared enemy from the front if it can be avoided. Frontal assaults are bloody and unpleasant, and your characters deserve better treatment than that. Let part of the team work around the flank and surprise the enemy. This will make your life far easier and much longer.

2.9 MEDICAL AID AND RECOVERY

Whenever someone has been wounded, the **Medical Aid and Recovery** rules are used to determine if he will survive. There are few hard and fast rules about how much damage it takes to kill a character. Instead, serious injuries simply increase the risk of fatality, and make more sophisticated medical care a necessity.

Whether a character lives or dies, and how long he will need in order to recover from his injuries, is determined using the **Medical Aid and Recovery Table (8A)**. The following terms are used on the table.

DT = Damage Total. This is the total of all Physical Damage (PD), modified to account for the character's Health.

HT = Healing Time. This is the number of days required for a character to fully recover from his wounds.

CTP = Critical Time Period. When a character is injured, he has this much time to seek Medical Aid before the player rolls to see if he survives.

"Who says Russian roulette isn't an acceptable way to rally a broken man?"

Lieutenant Axly

RR = Recovery Roll. This is the percentage chance that the character has of surviving his wounds. If no Recovery Roll is given, then the character will automatically die at the end of the Critical Time Period, unless better Medical Aid is found.

The Basis for Recovery

During combat, the player keeps a running total of the **Physical Damage (PD)** points taken. This PD Total, modified to account for the character's Health, determines the **Damage Total**. This measures the severity of his injuries; the greater the Damage Total, the more severe the injuries and the smaller the chance of surviving. The Damage Total is:

Damage Total (DT) = PD Total X 10 / Health Characteristic

Example: Trent has received two wounds, of PD 14 and 4, for a total of 18. His Health is 12, and so the Damage Total (DT) = 18 X 10 / 12 = 180 / 12 = 15. In this way, Trent's above average Health has reduced the effect that the damage will have on him.

If there is no entry for the character's DT, then the next lower entry should be used. A DT of 34 would use the DT 30 line, for example.

How much time a character has to seek and receive Medical Aid is determined by the **Critical Time Period (CTP)**. At the end of the CTP, he must make his **Recovery Roll**; if he makes this roll, he will survive. If he fails, he dies. The length of the CTP is given opposite the Damage Total on **Table 8A** and depends on the type of **Medical Aid** available.

Consider Trent, with a DT = 15. His CTP is found on **Table 8A** under the column "No Aid", and is 72 hours. If he does not receive Medical Aid in 72 hours, his Recovery Roll (RR) would also be taken from the "No Aid" column, and would be 85. Trent must then roll a 00-99 number; if it is less than or equal to 85, he will survive. If he survives, then the time in days for his wounds to heal is given by the **Healing Time (HT)**, found on **Table 8A** opposite the DT. In Trent's case, it is 30 days.

Medical Aid

Naturally, **Medical Aid** greatly improves the chance of survival. This improvement depends on the type of aid available, and each type is listed in a separate column on **Table 8A**. Medical Aid has been divided into four general types; **First Aid**, **Aid Station**, **Field Hospital**, and **Trauma Center**. Each type has its own Critical Time Period and Recovery Roll opposite the Damage Total.

There are six Recovery Roll entries under the Trauma Center category. Each of these represents a hospital of increasing sophistication, and is defined by its Technology Level. The Technology Level of a facility is given next to the time period represented in **Table 8C**. Any character who remains in a Trauma Center throughout the first third of his Healing Time may reduce his total Healing Time by 20%. For example, if the HT were 60 days, then a character remaining in a Trauma Center for the first 1/3 of that time, or 20 days, would subtract 20% from his HT. This subtraction would equal 60 days X 20% = 12 days, and would give him a total HT of 60 - 12 = 48 days.

In **Phoenix Command**, the treatment an injured character receives is very similar to the method used in modern warfare. Usually, First Aid is applied as soon as possible after a character is wounded. This immediately lengthens the CTP, to the number shown in the First Aid column. (This represents simply stopping the external bleeding of the wound.) At

that point, the character is moved to a better facility, depending on what is available. The goal is, of course, to get the character to the best hospital possible, and to use the intermediate steps as ways of stabilizing his condition.

Note that when the CTP is increased, the time available is still assumed to have begun when the injury took place.

Example: A character has a Damage Total (DT) = 3500. This uses the 3000 (or 3K) line on the Medical Aid and Recovery Table (8A). Checking a DT of 3000 under the column labelled No Aid, we see his CTP is 81 phases, with no Recovery Roll given. This means that without medical attention he cannot survive, and he has only 81 phases in which to receive that attention. Luckily, a medic arrives before the end of his CTP and treats him. Referring to the column labelled First Aid at a DT of 3000, we see the medic has increased his CTP to 2 hours. Unfortunately, he still has no RR. The First Aid, however, has at least stabilized his condition temporarily, and he is rushed to a Tech Level 13 Trauma Center before the end of 2 hours. His new CTP is now 18 days, and his RR = 30. So, 18 days after the injury, he rolls his 00-99 Recovery Roll. If less than or equal to 30 is rolled, he survives; if greater than a 30 is rolled, he dies.

If he survives, then the Healing Time (HT) for his wound is 88 days. It takes this long for his injuries to completely heal. If he remained in the Trauma Center for 1/3 of this time, or 29 days, he would be able to subtract 20% (18 days) from the total HT, and would be healed after only 70 days.

WOUNDED CAPABILITIES AND HEALING

Whenever a character is suffering the effects of an unhealed injury, his physical capabilities are reduced. This reduction depends on the character's status, which will fall into one of the following categories: Recent Wounds - Character Makes Knockout Roll; Recent Wounds - Character Fails Knockout Roll; and Old Healing Injuries.

Recent Wounds - Character Makes Knockout Roll

Recent wounds are ones which have been suffered during the current combat. (Once one hour has passed since the injury, they are considered Old Healing Injuries.) As long as the character makes his Knockout Roll, he is affected only by Disabling Injuries (Section 2.7) and can continue combat subject only to those limitations. These fresh injuries, if not disabling, are ignored due to the effects of adrenalin and other adjustments made by the body during crisis. Disabling injuries remain in effect until completely healed.

Recent Wounds - Character Fails Knockout Roll

A character who fails his Knockout Roll is incapacitated. With inexperienced combatants, (people with low Knockout Values), this often represents a rapid descent into shock, or being immobilized out of fear and confusion. With more serious wounds, it represents incapacitation due to extreme pain, shock due to blood loss, or an actual loss of consciousness.

The time a character remains dazed or knocked out is found on the **Incapacitation Time Table (8B)** by cross-indexing a 0-9 roll and the PD Total. Round the PD down to the nearest entry. Note that more serious wounds generally result in a longer period of incapacitation. After the **Incapacitation Time** has passed, the character is once again capable of action and has a penalty of Healing Time / 20 points subtracted from his Combat Actions, along with any problems due to disabling injuries.

Example: A character has failed his Knockout Roll and has a PD Total of 30. He uses the 0 PD line on Table 8B, and rolls a 2; he regains consciousness after 1 Phase. The Healing Time for a 30 PD wound is 41 days; after regaining consciousness, he suffers a HT / 20 or 41 / 20 = 2 point penalty to his Combat Actions.

Old Healing Injuries

From one hour after the injury until the time the wounds heal, the character suffers a "Days" / 20 point penalty to his Combat Actions. "Days" are the number of days remaining until the injuries heal.

Example: Trent has a Damage Total = 15 and, therefore, a Healing Time of 30 days. So, from one hour after his injury to the end of the first day, he has a 30 / 20 = 1.5 point penalty to his Combat Actions. (This rounds to 2 points.) The next day, he has a Healing Time of 30 days minus 1, or 29, and a 29 / 20 = 1.45 point penalty, which rounds down to 1.

2.11

EXPLOSIVES AND GRENADES

Explosives are a very potent force in combat. For area effect, for clearing buildings, and for similar activities, there is no type of weapon which is more valuable. This section presents a basic set of rules for using explosive weapons. All explosive damage data is contained in **Table 3D**; it need not be recorded on the Status Sheet. Detailed rules for the use of Explosive Weapons are contained in Section 3.6.

Explosive Weapon Accuracy

The **Shot Accuracy** of Explosive Weapons is found in the same manner as conventional weapons, with two exceptions. These are the **Explosive Weapon Target Size Modifiers** and the fact that the detonation site of all explosive rounds must be determined, even if the round missed.

Explosive Weapons are often aimed at a hex position, a building, or a large object, rather than a person. When this is the case, use the optional Explosive Weapon Target Size Modifiers shown on **Table 2C**. Simply add in the appropriate modifier when necessary. Note that the Target Size Modifier for a Hex is +12; this does not represent the modifier for a 2 yard diameter object. It represents the effective size of a hex when it is viewed from a standing position through the weapon's calibrated sights.

"Guns and Bullets, Grenades and Knives, With some of these, I might stay alive."

Fred the Singing Bandit

As mentioned above, a missed shot with an explosive weapon must be tracked. A bullet which misses its target can be ignored; an explosion cannot. If an explosive round misses, it is likely that it is either long or short of the target hex, but not too far to the right or left. Roll a 0-9 number; on a 0 through 4 the shot is short, and on a 5 through 9 it is long. To find how many hexes long or short it is, move down the appropriate Target Range column on the **Odds of Hitting Table (2A)** and find the entry with odds just greater than the number rolled. One half the difference between the SA which gives these odds and the SA required to hit, rounded up, is the number of 2 yard hexes by which the shot has missed. A shot may not miss by more than 1/3 the Range.

Example: Trent is firing a Grenade Launcher. His SA is 13 and the Range is 40, giving him a 67 to hit. He rolls an 82, however, and misses. Scanning down the Range 40 column, he sees that 3 lines down, at SA 16, the Odds of Hitting are 86. The shot has therefore missed by 3 / 2 = 1.5 = 2 hexes. He rolls a 7 for Long/Short; the shot is long. The round explodes two hexes past the target hex, on a direct line from where Trent fired.

Explosive Concussion Damage

The damage done by an explosive weapon is caused by **Concussion**; the shock wave generated by the blast. Explosive rounds in general have an effective **Blast Radius** of 6 hexes. This means that every person within 6 hexes of the blast location must check the **Explosive Concussion Damage Table (3D)** to determine the damage taken.

Simply choose the round type, and cross-index the target's **Range** in hexes from the burst with target exposure. For example, a target in the open 2 hexes away from a Frag Grenade would take 50 PD. Targets completely behind **Solid Cover** take no damage from explosives. The **"C"**, or **Contact** indicates the round actually hit the target.

3

ADVANCED RULES

The **Advanced Rules** use the same framework as the basic game; game scale, Movement, Field of View, and Action and Impulses are all unchanged. The major differences in the advanced game are in the Odds of Hitting and the Damage System. The Advanced Rules provide more detail and are more versatile than the basic game, yet add little complexity. Any or all of them may be added to the basic game, allowing players to tailor a system to their own needs.

3.1

ODDS OF HITTING

In the basic game, the character's Shot Accuracy is determined by adding his weapon's Aim Time Modifier to his Skill Accuracy Level (SAL). This Shot Accuracy is then cross-indexed with the target range to determine the Odds of Hitting. Optional Modifers can be added to the basic Shot Accuracy to account for target size, shooter firing stance, and movement. The Advanced System takes these concepts one step further. Each factor influencing accuracy is now treated as a separate **Accuracy Level Modifier (ALM)**. These ALM are added together for each shot to determine the shot's accuracy.

When a shot is fired, several factors modify the Odds of Hitting. These factors are: aim time, firing stance, and target range, visibility, motion, and size. Each of these effects has an Accuracy Level Modifier (ALM). The shot's accuracy is the sum of all applicable ALMs. This sum is called the **Effective Accuracy Level (EAL)**. The greater the EAL, the greater the Odds of Hitting. These ALMs are described as follows.

"For a lasting victory we must bury their hearts and minds."

Paul Maul

Aim Time ALM

The amount of time spent aiming has an important effect on accuracy. The greater the aim time, the more accurate the shot, as indicated by the weapon Aim Time Mods on your Status Sheet. A shot using 1 AC, is the quickest and is a Snap Shot. A shot using the maximum number of AC shown on the Weapon Data Tables, is the most accurate possible.

To correct weapon aim time accuracy for the shooter's skill, the shooter's **Skill Accuracy Level (SAL)** should be added to the weapon's Aim Time Modifiers and the sum recorded next to each Aim Time on the Status Sheet. These sums are called the **Shot Accuracy** and are used to determine the accuracy of each shot.

To gain the full accuracy of a weapon, the shooter must **"Assume a Firing Stance"**. That is, he must bring the weapon to a firing position where the aiming sights can be used and recoil handled. This costs 2 Action Counts (Table 7B) which do not count toward Aim Time. When moving or when stationary and not aiming, the shooter does not carry his weapon in a firing stance.

If the shooter does not want to use 2 AC establishing a firing stance, he may fire from the hip. Although faster, this is less accurate since the weapon's sights are not used. There is a -6 ALM for **Hip Firing** as shown on **Table 4B**.

"Why are you ducking? He couldn't possibly hit us in the head from there."

Humbert NoDose, his last words

Target Range ALM

The Target Range ALMs are given on **Table 4A**.

Firing Stance / Situation ALM

The Firing Stance/Situation ALMs are found on **Table 4B**. These cover typical firing stances (standing, kneeling, prone) and various situations such as Hip Firing.

Visibility ALM

Visibility ALM are given on **Table 4C**. These correct for smoke, darkness, optical scopes, and other effects on vision.

Movement ALM

Corrections for target and shooter motion are found on **Table 4D**. The **Moving Target ALM** is found on **Table 4D** by cross-indexing the target speed (in hexes per Impulse) and target range (in 2 yard hexes). If the entry is in the shaded portion of the table, then there is no restriction on Aim Time. If the entry is in the unshaded portion of the table, the shot's Aim Time is restricted to a maximum of 2 Impulses.

For shooters moving under their own power, the **Moving Shooter ALM** is found in the same manner as for a Moving Target. The Shooter's speed is cross-indexed with the target range on **Table 4D** to find the **Moving Shooter ALM**. A moving shooter has an Aim Time restriction of 1 Impulse. Note that the shooter's speed is the number of hexes moved the Impulse the shot was fired, and that a **moving shooter must Hip Fire.**

Target Size ALM

Target Size ALM for common targets are given on **Table 4E**. If the target cannot be found in the common listings, its Target Size ALM can be found opposite its diameter, in feet, on the **Target Size ALM Table (4F)**.

Effective Accuracy Level (EAL)

The **Effective Accuracy Level (EAL)** is the sum of all applicable ALM's and determines the Odds of Hitting. The following is an example of how the EAL is determined using the preceding ALM.

Example: Trent is prone and takes a shot after 6 AC of aim. The target is stationary, 50 hexes away, and firing over blocking cover.

Aim Time	ALM = 9	Aim Time 6 AC, from Status Sheet
Range	ALM = 5	Range 50 hexes, Table 4A
Firing Stance	ALM = 6	Prone, Table 4B
Target Size	ALM = 0	Firing over blocking cover, Table 4E
	EAL = 20	

The **Odds of Hitting** are found on the **Single Shot Odds Table (4G)**. Read down the table to the EAL, then across to the Odds of Hitting. In the preceding example, Trent has an EAL = 20, therefore, his Odds of Hitting are 67.

The player now rolls a 00-99 number using two ten-sided dice. If less than or equal to the Odds of Hitting is rolled, the shot hits. If greater than the Odds of Hitting is rolled, the shot misses.

Reflexive Duck

In the basic game there are optional modifiers for the target or shooter Ducking. This type of Duck is a **Reflexive Duck** in response to enemy fire. A player may take a Reflexive Duck any time he is firing or looking around cover. This cost no AC and allows him to bring his body back behind cover. When a player takes a Reflexive Duck, there is an additional

-5 ALM to any shots taken at him that Impulse, and any shot he takes is at an additional -10 ALM. Note that a Reflexive Duck interrupts any action the character was taking and brings him behind cover.

HIT LOCATION AND DAMAGE

When a target is hit, the **Hit Location and Damage** are found on the **Hit Location and Damage Table (6)**. There are two pages to this table. The first page is for weapons with a **Damage Class (DC)** of 1 to 4. The second is for weapons of DC 5 to 10.

The Hit Location sections of each page are identical and are found on the left-hand columns labeled **"Firing Over Cover"** and **"In the Open"**. The first column, "Firing Over Cover", is used for a target firing over or around blocking cover. The second column, "In the Open", is used for a target in the open.

To determine the Hit Location, refer to the appropriate column (target Firing or Open) and roll a 00-99 number. Find the number rolled in the appropriate column and move along that line to the second column. This gives the Hit Location. For a target Looking over cover, use the Firing column and a 00-22 roll.

Examples:

A roll of 15 hits a target Firing Over Cover in the Forehead.

A 09 hits a target In the Open in the Shoulder.

Aiming at Specific Body Locations

A shooter may choose to aim specifically at the target's Head, Body, or Legs. If this is done, the Odds of Hitting are figured in the normal way using the appropriate Target Size ALM from **Table 4E**. If a hit occurs, roll a 00-32 for the exact loaction of a Head hit, 57-99 for a Leg, or use the **Specific Hit Location Table (5D)** for Body hits. Damage is determined normally.

Resolving Damage

The **Physical Damage (PD)** inflicted is found to the right of the Hit Location and depends on the weapon's **Damage Class (DC)** and **Effective Penetraton (EPEN)**. The EPEN measures bullet impact after penetrating armor or cover. The EPEN is the weapon's PEN minus the target's Effective Armor PF for that hit location.

EPEN = Weapon PEN - Effective Armor PF

The **Effective Armor PF (EPF)** is the target's armor PF covering that hit location corrected for bullet glancing. To find the Effective Armor PF (EPF), cross-index the target's armor PF with a 0-9 roll on **Table 6D**. Note that the greater the 0-9 roll, the greater the Effective Armor PF.

No Penetration (EPEN less than or equal to 0)

If the EPEN is less than or equal to zero, the shot does not penetrate and does no damage. The damage done by nonpenetrating rounds is not included in this system. It iis covered in the **Advanced Phoenix Command Combat Supplement.**

Low Velocity Penetration (EPEN less than the Effective Armor PF)

If the EPEN is greater than zero but less than the Effective Armor PF, the shot penetrates but is substantially retarded. The bullet has been significantly slowed, and its killing power reduced. When this occurs, find the Physical Damage (PD), by going right from the Hit Location to the **DC = 1** column. Then find the column with EPEN less than or equal to the EPEN of the hit and read off the damage.

"Don't think of it as losing a leg. Think of it as eliminating the risk of tripping over your own two feet."

Dr. Oscar Sneiderbunk

Physical Damage (PD) measures wound severity. The greater the PD, the greater the wound severity and chance of incapacitation. A PD entry followed by "H" is in hundreds of points, "K" in thousands, "T" in ten thousands, "X" in hundreds of thousands, and by "M" in millions (e.g., 2H = 200, 3K = 3,000, 7T = 70,000, 1X = 100,000, and 1M = 1,000,000).

Example: A target wearing body armor with PF = 2, is hit in the shoulder by a weapon whose PEN = 7. A 9 is rolled for the Effective Armor PF giving an EPF = 4.

EPEN = PEN - EPF = 7 - 4 = 3

Since the EPEN is greater than zero but less than the EPF, the DC = 1 column is used. For an EPEN = 3, DC = 1, hit in the shoulder, the Physical Damage (PD) = 4 points.

High Velocity Penetration (EPEN greater than the EPF)

If the EPEN is greater than the EPF, the shot's penetration is essentially unretarded, and the Physical Damage (PD) is found by cross-indexing the EPEN and Hit Location under the projectile's full Damage Class (DC) column.

Example: A target in body armor with EPF = 4, hit in the shoulder by a rifle with a PEN of 17, has an EPEN = 17 - 4 = 13. The EPEN is greater than the EPF, so the weapon's DC = 6 is used. With EPEN = 13, the Physical Damage (PD) = 300 points.

Special Notes

These damage tables are the result of detailed computer generated anatomical models. These models provide the most accurate simulation of bullet wounds available. Note that the values on the table show large jumps in physical damage. This models penetration into a vital area, such as the heart. Repeated values indicate the bullet has exited the other side of the target (overpenetrated). More detailed and graphic representation of these tables is available in the **Phoenix Command Small Arms Damage Table Supplement**. That supplement details bullet penetration through the body with 1/10 PEN resolution, and provides Hit Locations for front, oblique, rear, and side profiles.

3.3

DISABLING INJURIES AND SHOCK

Each time a combatant is wounded, he may fall unconscious or become dazed. If this occurs, he is down and out of combat; if it doesn't, he may continue fighting restricted only by **Disabling Injuries.** A Disabling Injury to the limbs or spine occurs whenever the damage enters a shaded portion of **Table 6A**. A Disabled limb cannot be used until the injury completely heals.

The Damage Tables represent the Physical Damage done by projectiles and their effect on survival and recovery. The immediate shock and trauma associated with broken bones has not been included as it does not affect long term survival. To account for the short term effects of shock and broken bones, the **Shock PD** values of **Table 6C** are added to the PD of Disabling Injuries for purposes of Knockout. The Shock PD is effective only on the Impulse it is inflicted. It is not included in the PD Total after the Knockout Roll is either made or failed.

Example:

A target hit in the Arm Bone by a shot with EPEN = 3 and DC = 2 does 5 PD and is a Disabling Injury to the upper arm. This makes the Knockout PD of the wound 5 plus the Shock PD of 20 from Table 6C, or 5 + 20 = 25. Ffor Knockout, the target's PD Total is increased by 25 points. For purposes of survival and recovery, only the basic PDof 5 is included in the PD Total.

FULLY AUTOMATIC WEAPON FIRE

Fully automatic weapon fire is done in half second (one Impulse) bursts and is often tracked across the target(s). The original point of aim is often to one side of the target(s) and the **Arc of Fire** tracked across as shown in **Figure 2**.

The Arc of Fire determines overall effectiveness since it defines bullet distribution. In **Figure 2A**, the Arc of Fire is 2 hexes, and there are 4 bullets into each hex. In **Figure 2B**, the Arc of Fire is 4 hexes, and there are only 2 bullets into each hex.

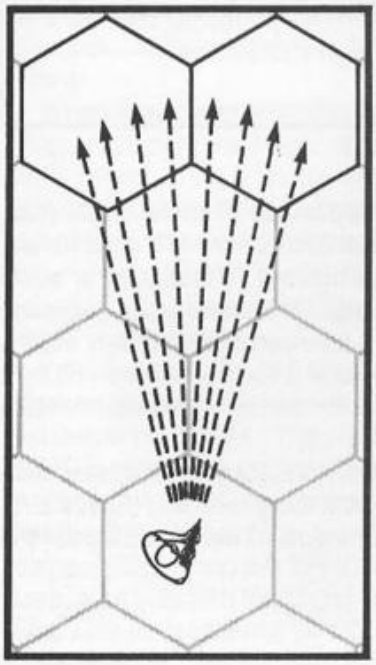


Figure 2A

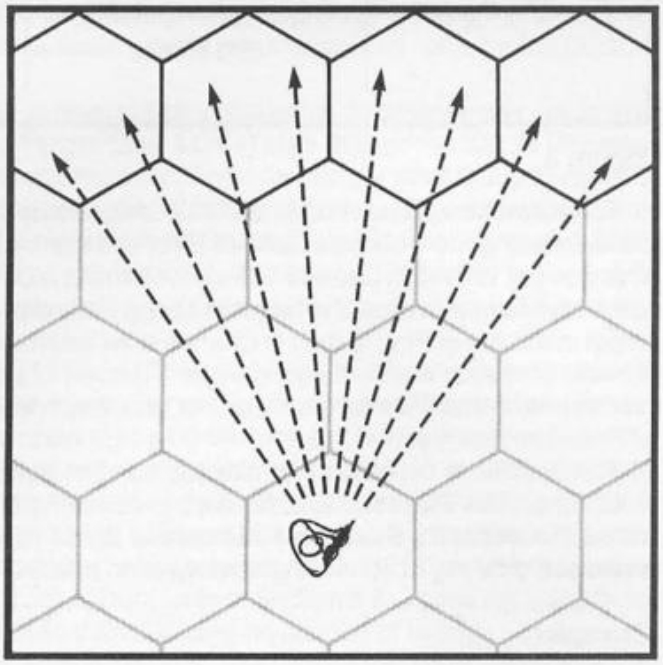


Figure 2B

"What do you expect me to do with him? He's got more holes than a golf course."

Dr. Oscar Sneiderbunk

Burst Elevation

To find the Odds of Hitting, the **Elevation** of the burst must first be determined. This elevation is the height of the burst relative to the target(s). If the shooter properly aims, the burst Elevation will correspond to the targets' rather than going over their heads or into the ground.

To determine if the burst is at the proper Elevation, the burst's EAL must be found. This Automatic weapon EAL is identical to an EAL for single shot fire except the **Automatic Elevation Target Size Modifier (Auto ELE)** is used instead of the normal Target Size ALM. The Auto ELE target size modifier is found on **Table 4E** for common targets and measures target height. For nonstandard targets, it is found on **Table 4F** opposite target height in feet. The Auto ELE is summed with the other ALMs, as usual, and this EAL is used with the **Burst Elevation Odds Table (4G)**. If the result is a miss, the burst was either too high or too low and misses.

Arc of Fire

If the burst is at the proper Elevation, the **Arc of Fire** must be determined. The shooter designates a burst initiation hex (or position on the table). This is the position at which the Arc of Fire begins. The shooter then designates over which hexes the burst is swept. The minimum width of the Arc of Fire depends on target range and the shooter's control of the weapon's recoil. This is given by the weapon's **Minimum Arc (MA)** and has been recorded on the Status Sheet for each target range. The Minimum Arc is the minimum number of hexes over which the burst must be tracked. The maximum width of the Arc of Fire is limited only by the shooter's **Field of Fire**. All targets at the proper Elevation, which are in the hexes covered by the Arc of Fire, may be hit. On level ground, the depth of the Arc

of Fire extends up to 100 two yard hexes toward (but not past) the shooter and 100 two yard hexes past the target as shown on **Figure 3**. All personnel in this area are eligible targets. In the case of contoured terrain, or if a question arises as to which targets are eligible, common sense should be used.

"Settle down or I'll sew your ear lobes to the bed."

Dr. Oscar Sneiderbunk

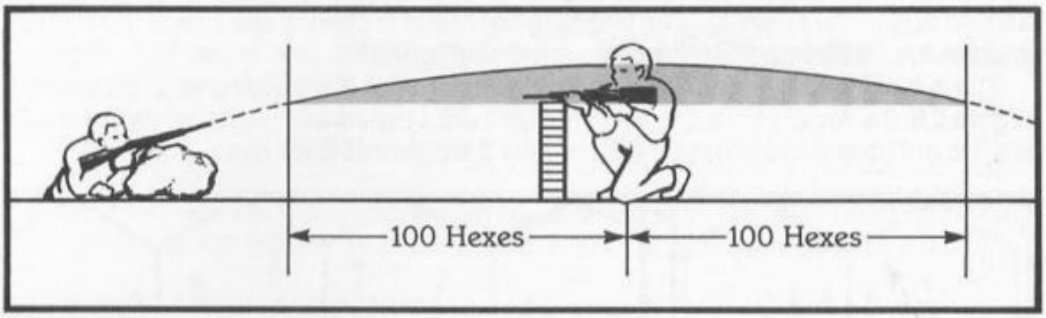


Figure 3

To determine if a target is hit, enter the **Automatic Weapon Hit Chance Table (5A)**, cross-indexing the weapon's **Rate of Fire** and width of the **Arc of Fire** in 2 yard hexes. This number is the **Hit Chance**. The shooter rolls a 00-99 number. If less than or equal to the Hit Chance is rolled, the target has been hit by one round. The same is done for each target in the Arc of Fire. If the Hit Chance is an asterisk (*) followed by a number, it is the number of rounds which hit each target. Thus, an *2 indicates a target has been hit by 2 rounds. Note that the maximum number of bullets hitting is limited by the weapon's Rate of Fire. See also Section 3.7.

The shooter is capable of continuous burst of automatic fire subject to ammunition limitations. The Elevation EAL for each succeeding burst is the preceding burst's EAL minus the weapon's **Sustained Automatic Burst (SAB)** value. This accounts for the increased difficulty of controlling a weapon on autofire.

Example:

Trent fires a burst from an M16A1 rifle while rushing two opponents. The opponents are 5 hexes away, exposed and kneeling. Trent's EAL is:

Aim Time	ALM = 2	Aim Time 2AC, Status Sheet
Range	ALM = 22	Range 5 hexes, Table 4A
Hip Fire	ALM = -6	Table 4B
Shooter Motion	ALM = -8	Shooter moved 1 hex the Impulse the burst was fired, Table 4D
Target Size	ALM = 11	Auto ELE, Exposed-Kneeling, Table 4E
	EAL = 21	

Using the Burst Elevation Odds Table (4G), the Elevation Odds of Hitting are 86. Trent rolls a 42 which indicates the burst is at the proper Elevation. His Minimum Arc = .4, so he must track the burst over a minimum of .4 hex. He chooses to track the burst over 3 hexes to cover both opponents in the Arc of Fire. His Rate of Fire = *7. The Automatic Weapon Hit Chance Table (5A), with a Rate of Fire = 7 and Arc of Fire = 3 hexes, gives a Hit Chance = 29. Trent rolls an 11 and hits the first opponent with one round. He rolls a 66 and misses the second opponent.

Seeing that he missed, Trent continues to spray the area with a second burst. To determine if this second burst is at the proper Elevation, the prior burst's EAL of 21, minus the weapon's SAB value of 3, is used. The second burst's EAL = 21 - 3 = 18. Trent rolls a 23 and the burst is, again, at the proper Elevation. This time Trent puts the burst into the remaining target's hex with an Arc of Fire = .4. The Hit Chance for Rate of Fire = 7 and Arc of Fire = .4 is *2. Donovan hits the opponent with two rounds.

SHOTGUNS

Unlike a rifle or pistol, a shotgun covers an area with pellets. The size of this area, or pattern, depends on the shotgun, the type of shot fired, and the target range. At pointblank range, the pattern is very small and shotgun accuracy is much like a rifle. At longer range, the shot spreads and the pattern covers many feet. The size of this pattern is given by the **Shotgun ALM (SALM)** and is found on the **Weapon Data Tables** under the PEN and DC values. The greater the SALM, the larger the pattern and the easier it becomes to hit the target. But hitting the target with the pattern does not always mean you hit the target with pellets. If the pattern becomes too large, the shot spreads over too large an area to be effective. To accurately model both these effects requires special rules for the Odds of Hitting.

When firing buckshot, the EAL is determined in the same manner as any single shot weapon, except the larger of the **Target Size ALM (Table 4E)**, or the **SALM (Weapon Data Table)**, is used for the target size modifier. Enter the **Single Shot Odds Table (4G)** with this modified EAL to determine the Odds of Hitting with the shotgun's pattern. Note that at very close range, many shotguns have no SALM value. At these ranges, the shot has not spread and is essentially one mass when it strikes. This greatly increases its penetrating power and damage potential. For these cases, the shotgun is treated as a single shot weapon.

If the pattern hits, the number of pellets hitting is determined by the **Base Pellet Hit Chance (BPHC)**. The BPHC is a 00-99 number and is found on the **Weapon Data Tables** just below the SALM. The shooter now rolls a 00-99 number. If less than or equal to the BPHC is rolled, the target is hit by one pellet. If greater than the BPHC is rolled, the target is missed. A BPHC preceded by an asterisk (*) gives the number of pellets that hit. Note that the BPHC gives the chance of hitting a Target Size ALM = 0. Section 3.7 gives a method of adjusting the BPHC for smaller or larger target sizes. BPHC values of less than 0 are used only with the target size adjustment rules of Section 3.7. Those not using those rules should consider a BPHC of less than 0 to give no chance of hitting.

The **Pattern Radius (PR)** listed below the BPHC gives the size of the shotgun's pattern in 2 yard hexes. If the pattern hits, all targets within PR hexes of the intended target are also in the shotgun's pattern and could be hit by pellets. The shooter must check each target in the pattern for hits using the preceding BPHC.

Example:

Axly fires a SPAS 12 shotgun at an opponent who is partially behind Blocking Cover 15 hexes away. The EAL for a shotgun firing buckshot is:

Aim Time	ALM =	-6	Aim Time 2AC
Range	ALM =	13	Range 15 hexes, Table 4A
Target Size	ALM =	7	Larger of the Target Size ALM of 0 or SALM of 7
	EAL =	14	

"Oops."

Ex-Officer Axly

Entering the Single Shot Odds Table (4G) with this EAL gives an Odds of Hitting of 27. Axly rolls a 23 and hits with the shotgun's pattern. The BPHC is *2, so Axly hits the opponent with two pellets. Unfortunately, the opponent was also hiding behind a hostage. Since the Pattern Radius (PR) is .2 hexes, the hostage is also in the shotgun's pattern, and Axly also hits the hostage with two pellets.

When determining the Hit Location and Damage for multiple pellet hits, there are two ways of resolving damage. Each pellet hit can be figured separately, or, for simplicity, all pellets can be run as hitting the same location. In this case, one Hit Location is rolled, and the resulting Physical Damage is multiplied by the number of pellets that hit.

Fully Automatic Shotguns

Special rules are required to handle a shotgun firing a fully automatic burst. To determine the chance of hitting with the shotgun's patterns, the normal automatic fire rules apply using the larger of the **Target Size Elevation ALM** or the **SALM** for the target size modifier. Enter the **Auto Elevation Odds Table (4G)** with this modified EAL to determine the Odds of Hitting the target elevation with the shotgun's patterns. If the patterns are at the right elevation, enter the **Automatic Weapon Hit Chance Table (5A)** and cross-index the weapon's Rate of Fire (ROF) and Arc of Fire just as you would for an automatic burst. This gives the number of patterns hitting, or the chance of one pattern covering the target. Determine pattern hits just as you would for automatic fire against all targets in the Arc of Fire. For each pattern hit, use the BPHC to determine number of pellet hits just as you would for a single shotgun blast.

Grouping Multiple Pellet Hits

To more accurately handle multiple pellet hits the following rules can be used to group the resulting Hit Locations. To use these rules, the Hit Location of the first pellet is determined by a 00-99 roll using standard rules. All additional hits from the same blast should be grouped around this location. To determine the spacing of this grouping, consult the following **Shotgun Multiple Hit Table** . Enter this table with the SALM and find the **Hit Location Spacing (HLS)**. All pellet hits should be selected within plus or minus HLS percent around the first Hit Location on the Open Hit Location column. These additional Hit Locations may be determined randomly from within this spacing or distributed evenly.

Shotgun Multiple Hit Table

SALM	HLS	SALM	HLS	SALM	HLS	SALM	HLS	SALM	HLS
< -12	1	-4	4	2	11	8	25	14	60
-10	2	-2	6	4	14	10	34	16	79
-6	3	0	8	6	19	12	45	18	100

Example: In the preceding example, Axly hit the hostage with two pellets. If he rolls a 07 for his Hit Location roll, he hits the hostage in the Shoulder Glance with the first pellet. At range 15, the SPAS 12 has an SALM of 7 and the HLS = 19 (using the SALM 6 entry). This means the second pellet must hit between a hit location roll of 07 - 19, or 00, to 07 + 19, or 26. The second hit would then be rolled within this spacing and will result in a hit from the head to upper body.

3.6 EXPLOSIVE WEAPONS AND GRENADES

Explosive Weapons and **Grenades** are found in the Weapon Data Tables and are divided into two categories; Explosive Weapons such as grenade and rocket launchers, and Hand Grenades. For Explosive Weapons, the values on the left side of the table are identical to those of the standard small arms. The PEN on the left side is the projectile's PEN and gives its penetration capability. It is primarily used to determine the projectile's penetration against armored targets. If the PEN is less than or equal to the **Effective Armor PF (EPF)**, the projectile detonates on the armor's surface but does not penetrate. The explosion is treated as a blast outside the armor. If the PEN is greater than the Effective Armor PF, the explosive penetrates and all personnel within take damage from the explosion just inside the armor's wall. The Effective Armor PF is defined in Section 3.2.

The values on the right side of the table are the weapon's explosion data. The PEN and DC give the penetration and damage of the explosion's shrapnel depending on target range from burst in 2 yard hexes. The **Base Shrapnel Hit Chance (BSHC)** is the chance of hitting each target in the burst area with shrapnel. The **Base Concussion (BC)** gives the concussion damage of the explosion. Use of these values will be discussed later in this section.

Hand Grenade and Explosives data are found in the Grenades / Explosives section of the Weapon Data Tables. The **Arm Time (AT)** is the Time, in AC, to arm the grenade; the **Fuse Length (FL)** entry, its fuse length in 2 second phases; and the **Range (R)**, the distance it can be thrown in 2 yard hexes from a kneeling stance. The PEN, DC, BSHC, and BC are the same as described in the preceding paragraph. An "I" for a Fuse Length entry indicates the grenade is Impact detonated.

Note that some of the following material has been repeated from Chapter 2 for convenience.

Explosive Weapon Accuracy

The EAL of an Explosive Weapon is found in the same manner as conventional weapons, with two exceptions. These are the **Explosive Weapon Target Size Modifiers** and the fact that the detonation site of all explosive rounds must be determined, even if the round missed. Rules governing these situations are as follows.

"I'm too busy worrying about what I've done to think about what I'm doing."

Axly

Explosive Weapons are often aimed at a hex position, building, or large object, rather than a person. The Target Size ALM of a doorway, window, or building is found on **Table 4F**, opposite target diameter in feet. Note that the Target Size ALM of +12 for a hex is not for a 6 foot diameter object. It is an effective target size as viewed from a level firing position using the weapon's calibrated sights. If the shooter is firing from a highly elevated position, the hex ALM can be taken from **Table 4F** for a 6 foot diameter target and is +15.

An Explosive Weapon's EAL is found in the same manner as conventional weapons, using the preceding Target Size ALM. This EAL is used on the **Single Shot Odds Table (4G)** to find the Odds of Hitting. If the hit roll is greater than the Odds of Hitting, the shot misses. For a miss, refer to **Table 4G** and find the EAL entry with odds just greater than the number rolled. The difference between this EAL and the EAL required to hit determines the number of 2 yard hexes by which the shot misses. Enter the **Shot Scatter Table (5C)** with this number and read off the number of hexes by which the shot misses. As mentioned above, a missed shot with an explosive weapon must be tracked. If the explosive round misses it is likely that it is either Long or Short of the target hex, but not too far to the right or left. Roll a ten-sided die; on a 0 through 4 the shot is Short, on a 5 through 9 it is Long. For misses of greater than 1 hex, the impact hex is either Long or Short and in a direct line from shooter to target. For misses of 1 hex, the impact hex is selected randomly from those one hex from the target hex on a 1 to 6 roll.

Example:

Donovan is firing a grenade launcher. His EAL is 14 giving him a 27 to hit. He rolls an 82, however, and misses. Scanning up the Odds of Hitting Table he sees that 9 lines up, at EAL 23, the Odds of Hitting are 86. The difference between this EAL and that required to hit is therefore 9. Entering the Shot Scatter Table (5C), he sees that his shot missed by 2 hexes. He rolls a 7 for Long/Short; the shot is long. The round explodes 2 hexes past the target hex, on a direct line from where Donovan fired.

Hand Grenade Accuracy

The accuracy of thrown grenades is found in a similar manner to Explosive Weapons. For thrown grenades, the EAL is the sum of the target Range ALM, the thrower's Skill Accuracy Level (SAL), Aim Time Modifiers (Table 4H), Target Size ALM, and applicable Visibility and Motion ALMs. As with Explosive Weapons, the Target Size ALM for a hex is +12.

Thrown Grenade Aim Time in AC	Aim Time ALM
1	-26
2	-18
3	-14
4	-12
6	-11
8	-10

"Is it suppose to smoke like this?"

Trebor Nawoc

Scratch, scratch. "I can just barely make it out, it's in Russian. It says, This face towards enem..."

Din the Decisive, his last words

"Grenade? Where?"

Burce the Blind

Explosive Damage

Explosions have two damaging effects: shrapnel and concussion. The **Base Shrapnel Hit Chance (BSHC)** measures shrapnel generation while the **Base Concussion (BC)** indicates concussion damage. These values are found on the right side of the **Weapon Data Tables** depending on target range from burst.

The **Base Shrapnel Hit Chance (BSHC)** is a 00-99 number and is the chance of hitting with shrapnel. Roll a 00-99 number for each target in the burst area. If less than or equal to the BSHC is rolled, the target is hit by one piece of shrapnel. A **"C"** on the table is for a target in Contact with the explosive. An asterisk (*) preceding the BSHC gives the number of shrapnel pieces hitting. Note that the BSHC gives the chance of hitting a Target Size ALM = 0 target. Correction of the BSHC for smaller or larger target size is the subject of Section 3.7. BSHC values less than 0 are used only with the target size adjustment rules of Section 3.7. Those not using Section 3.7 should consider a BSHC value of less than 0 to indicate no chance of hitting with shrapnel.

Shrapnel Hit Location and Damage are determined in the normal way using the PEN and DC from the right side of the Weapon Data Table. In determining multiple hits from shrapnel, the Hit Location and Damage for each piece can be figured separately, or, for simplicity, all pieces can be run as hitting the same location. In this case, one Hit Location is rolled, and the resulting Physical Damage is multiplied by the number of pieces hitting.

To find the **Concussion Damage**, enter the right side of the Weapon Data Table at the target range from burst and find the **Base Concussion (BC)**. The BC is the Physical Damage (PD) points done to a target in the open. The **Blast Modifier Table (5B)** contains modifiers to this Base Concussion. The actual Concussion Damage is the BC times appropriate Blast Modifiers. The total Explosive Damage is the sum of the shrapnel and concussion damage.

Concussion PD = BC x Blast Modifiers

Explosive Damage = Shrapnel Damage + Concussion Damage

Example: Donovan is caught in an alley with an empty rifle as two opponents charge his position. He has time to arm a US model M26A2 grenade, and, listening to the enemy's approach, throws it around the corner, aiming at point X of Figure 4.

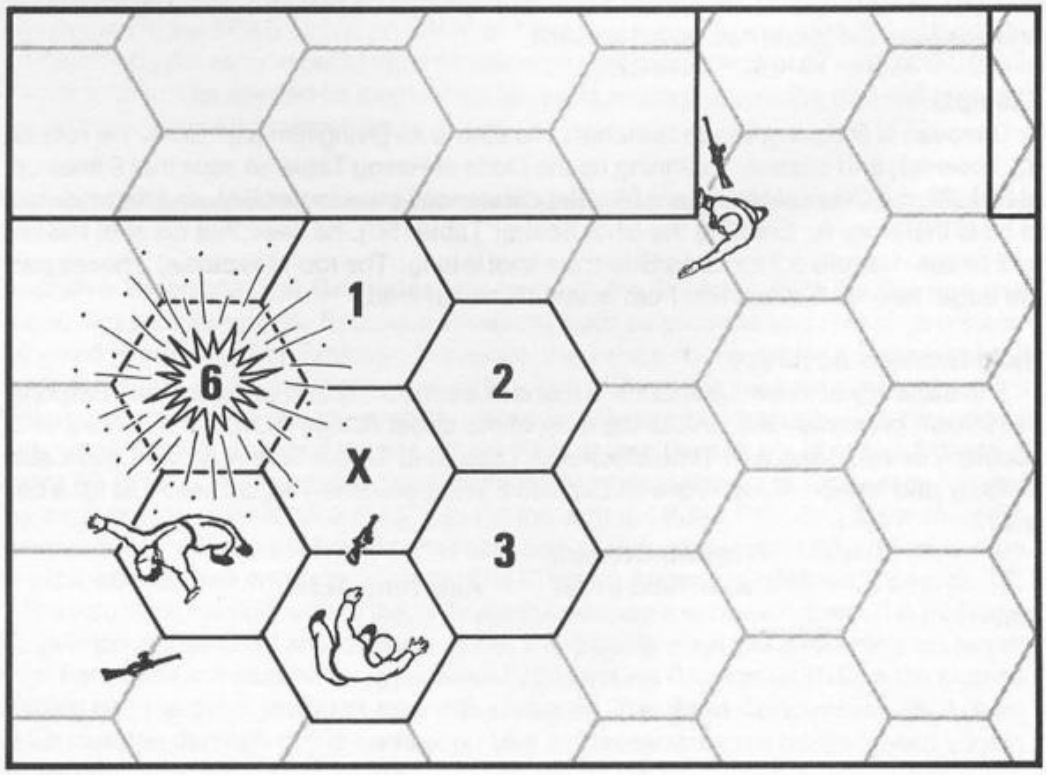


Figure 4

Donovan's EAL for this throw is:

Range	ALM	=	25	Range 3 hexes, Table 4A
Skill	ALM	=	9	Skill Accuracy Level
Visibility	ALM	=	-14	Throwing Not Looking, Table 4C
Aim Time	ALM	=	-12	Aim Time 4 AC, Grenade Aim Time Table (4H)
Target Size	ALM	=	12	Hex grid target size
	EAL	=	20	

Donovan's Odds of Hitting the intended target hex are 67. Donovan rolls a 71 and misses. The EAL with odds just greater than the number rolled is EAL = 21 (Odds 74). So Donovan missed his target hex by 21 - 20 = 1 EAL. This means a miss by 1 hex referring to the Shot Scatter Table (5C). The hex is determined randomly from those one hex from the intended target. Using a 1 to 6 roll, it lands in hex number 6 (see Figure 4). The grenade had an Impact fuse so explodes on impact.

Opponent 1 is caught one hex from the blast and is hit by one piece of shrapnel since the BSHC is *1. The Base Concussion (BC) is 176, so, in addition to the shrapnel hit, he receives BC x Blast Modifier = 176 x 1 = 176 PD in concussion damage.

Opponent 2 is two hexes from the blast and the BSHC is 25. Donovan rolls a 64 and misses the opponent with shrapnel. The BC is 52, so the opponent receives 52 x 1 = 52 PD in concussion damage.

Donovan was five hexes from the blast and behind solid cover around the corner. He is immune to shrapnel damage, and the concussion damage he receives is the BC = 12 (range 5) times the Blast Modifier = .01 (behind solid cover), 12 x .01 = .12 = 0 PD.

3.7

HIT CHANCE AND TARGET SIZE

In the basic game, the **Automatic Weapon Hit Chance**, shotgun **Base Pellet Hit Chance (BPHC)**, and **Base Shrapnel Hit Chance (BSHC)** are based on a Target Size ALM = 0. This is why these values are called Base values. If the player wants to more accurately handle the effects of Target Size on these Hit Chances, he can use the following rules.

To account for target size, enter the appropriate **Hit Chance Table (5A)** with the appropriate Arc of Fire, shotgun BPHC, or BSHC. Now, move up or down the table from this position to find the Hit Chance corrected for Target Size. If the Target Size ALM = +8, move up the table 8 lines and read off the Hit Chance. If the Target Size = -4, move down the table 4 lines to find the Hit Chance. When finding the Automatic Weapon Hit Chance or Shotgun Pellet Hit Chance, the **Automatic Width target size modifier (Auto WTH)** is used for the Target Size ALM. This Auto WTH is found on **Table 4E** for common targets or on **Table 4F** opposite the target's width in feet. Note that the second column of the **Automatic Weapon Hit Chance Table (5A)** called **"Index"** is simply a list of the line numbers on **Table 5A**. This Index makes moving up or down lines on the table easier.

For a shotgun, the number of pellets hitting cannot be greater than the **Pellet Number** given next to the BPHC on the Weapon Data Table. Likewise, for fully automatic fire, the number of hits per burst is limited to the weapon's Rate of Fire.

Examples:

The Automatic Weapon Hit Chance for an Arc of Fire = 3, Rate of Fire = 7, and Auto WTH target size = 3 is 44.

The Pellet Hit Chance for a BPHC = 37, and Auto WTH target size = -3 is 15.

The Shrapnel Hit Chance for a BSHC = 21, and Target Size ALM = 8 is *2.

3.8

BLOCKING AND NONBLOCKING COVER

Cover is a general term used to describe objects and materials behind which a target hides from view. Because bullets penetrate many barriers, cover has been divided into two categories, Blocking and Nonblocking.

A target is behind **"Blocking Cover"** when the cover will stop penetration of the enemy's weapon. The target is behind **"Nonblocking Cover"** when the cover will not stop penetration.

The weapon's PEN measures its penetrating power. The cover's **Protection Factor (PF)** measures its protection and is given on the **Cover Protection Factor Table (7C)**. If the weapon's PEN is greater than the cover's PF, the weapon penetrates and the cover is Nonblocking. If the PEN is less than or equal to the PF, the cover is blocking.

If the target is behind Nonblocking cover, as in the case of a man firing over a cardboard box, the entire target area, both visible and hidden, is used for the **Target Size ALM** in Section 3.1. In this case, the Target Size ALM would be for a man standing exposed (ALM = +7) rather than a man firing over blocking cover (ALM = 0).

"It won't do you any good to hide behind the girl. She'll only stop 3 points."

Gil the Treacherous

Hit Location and Damage

Note that the Hit Location column on the left side of **Table 6** does not contain numbers for all hit locations. This divides the table into two parts, giving target areas exposed when Firing Over Cover or In The Open.

When a hit is scored on an opponent behind **Nonblocking Cover**, the second column (Open) is always used. If he is Firing Over Cover and the 00-99 hit location roll is in the top part of the table, he is hit in an exposed location. Otherwise, the bullet must penetrate the cover before striking. In this way, one roll tells you where you hit and whether or not that location is protected by cover. This distinction may be significant in determining damage. The EPEN, used in Section 3.2 to resolve damage, is the weapon's PEN minus cover PF minus the target's Effective Armor PF (EPF).

EPEN = weapon PEN - cover PF - EPF

Example: A target is Firing over Nonblocking Cover. Since the cover is Nonblocking, the 2nd column, labeled In The Open, is used. A 93 is rolled, indicating a Hit Location of Shin. This Hit Location is in the bottom part of the table, so it is behind the Nonblocking Cover. The bullet penetrates the cover and strikes the target. If a 02 were rolled for the hit location, the bullet would strike the target in the Forehead. Since this Hit Location is in the top part of the table, it is an exposed area, and does not have to penetrate the cover.

4

GAME TIPS AND PLAYING AIDS

This Chapter presents game tips designed to speed up play, a list of changes in this edition of **Phoenix Command**, and a set of tournament rules from which quick pick-up games can be run. It should help the player get started, and also provides a few beginning scenarios and maps.

4.1 GAME TIPS

Delegation of Work

There are several ways to make the game play more quickly. The referee can delegate such things as Hit Locations and Damage to an experienced player, and each player can figure his own Odds of Hitting, Knockout, and Disabling Injuries. Game play is then a sequence of the referee calling a new phase, all players moving and determining Odds of Hitting, the player with the Damage Tables resolving PD for all shots hitting, and each player resolving Knockout and Disabling Injuries.

Ranging Stick

To speed up EAL determination, take a long straightedge, such as a yard stick, and mark it in hex increments. If a one inch per hex scale is used, make a mark each inch down the length of the stick. Now, refer to the **Target Range ALM Table (4A)**, and indicate the corresponding Range ALM next to these marks. The first mark would be +33, the second mark +28, and so on. When a shot is fired, instead of counting hexes to find the Range ALM, place the Ranging Stick at the shooter's position and extend it over the target to read off the Range ALM.

Markers

To help regulate the character's position on the game surface, indicate exposed figures by placing a marker such as a penny next to a figure who is, for example, looking out a window. This saves time asking which figures are, or are not visible. Figures around a corner or behind a waist high wall, with no marker, are assumed unexposed. Figures with a marker are assumed to be looking or firing around the corner or over the wall.

4.2 SAMPLE SCENARIOS

Scenario 1 The Bridge at Oppenheim

It is the fifth day of the Russian invasion of Germany, and they have reached the Rhine. The Russians have sustained heavy losses and are no longer an indomitable war machine, but the German and NATO armies have suffered also. The remnants of your NATO squad are sent to Oppenheim, just south of the smoking ruins of Mainz and Wiesbadden. There, you are to join a fresh battalion and hold or destroy the bridge. Upon arrival, you find yourselves alone. When you report this, new orders are given: Hold the bridge until reinforcements arrive.

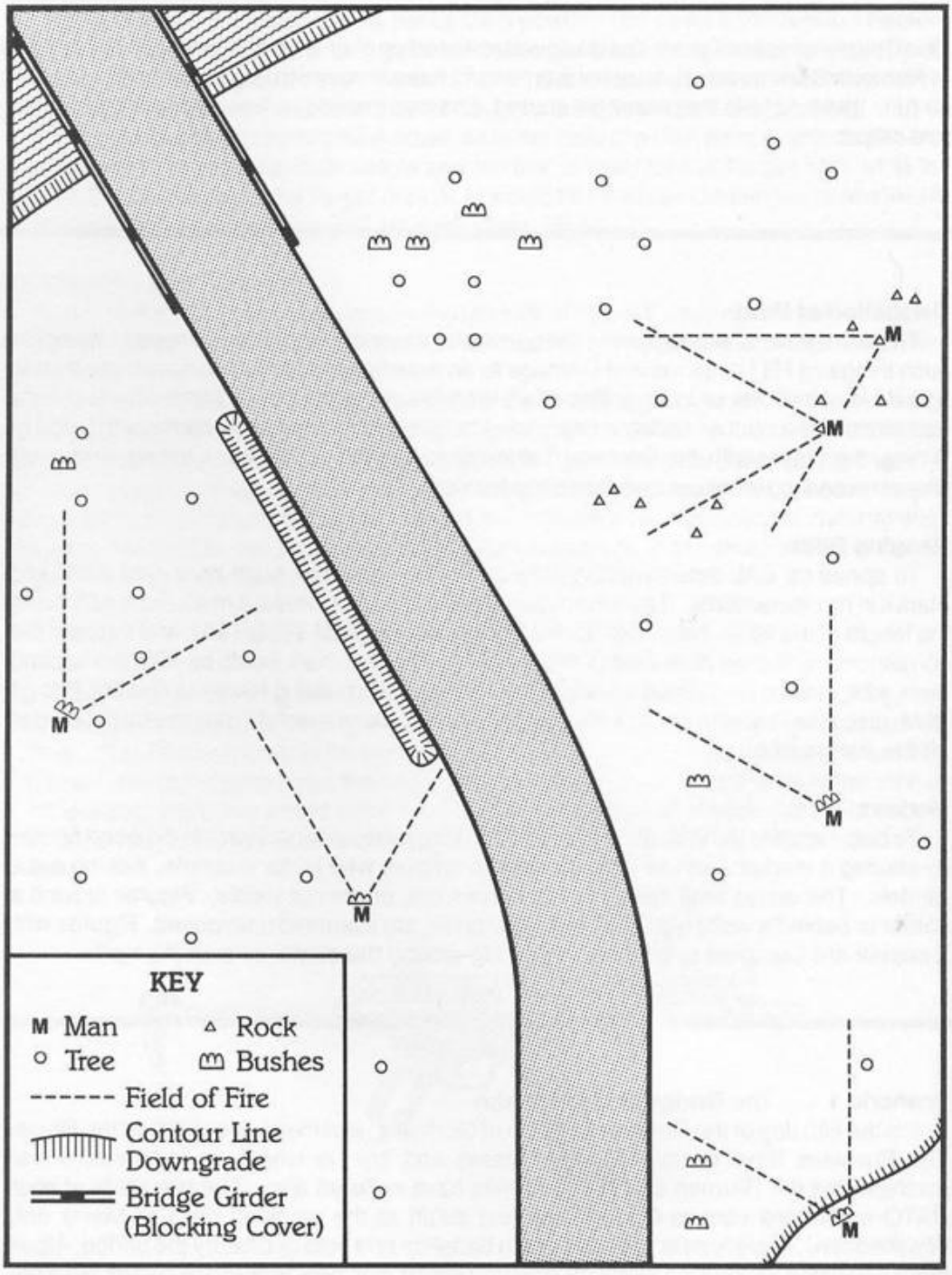
Three hours later your squad is well dug-in in a "buzz-saw", so that everyone can be counted as looking over cover (Target Size ALM = -4, Auto ELE = -3) while still being able to fire from a braced kneeling stance (ALM = +5). You have at your disposal one M249 Minimi with a 200 round belt. Each man has an M16A1 and two extra magazines.

This beginning scenario is designed for 5 to 8 players, each of whom will run one man, while the referee runs the enemy. It is pretty much a "turkey shoot", aimed at teaching the basics of Odds of Hitting and Damage.

To set up this scenario, study the map and copy it onto a suitable playing surface (hex map or table with 1 hex = 1 inch). The scale for this scenario is the standard 2 yards per hex. Place each man on the field so that his Field of Fire (Section 2.3) covers the bridge.

"If you're in combat
And the odds aren't fair,
Don't look for me,
I won't be there."

Fred the Singing Bandit



Scenario 1: The Bridge at Oppenheim

The idea behind the "buzz-saw" pattern is to overlap Fields of Fire from different directions, so that an enemy cannot find cover from all incoming fire. The trees and rocks marked on the map are blocking cover, but can only really cover a man from one direction of attack. So, for maximum effect, the squad's men should be spread out on both sides of the road. On a map, the "Ms" and dashed lines indicate a possible set-up for 6 men and their Fields of Fire.

As mentioned above, the squad is well dug-in. The men are in foxholes with sandbags on the rim so that they can fire, while only exposing the top of their heads and eyes. This gives each man a very small target area, making him hard to hit. Since sandbags to either side of his Field of Fire block his periphery, only opponents who are in his Field of Fire can fire at him. The disadvantages of this set-up are 1) Field of Fire cannot be changed without losing the preceding advantages (if changed he becomes a man firing over cover, Target Size ALM = 0, Auto ELE = +2), 2) if a man is hit it will be in the head (use the firing column with a 00-22 roll), and 3) his Field of View is limited to his Field of Fire. Note that you will not find this "dug-in buzz-saw" in the rules: it is an example of how you can expand the realism of play by common sense extensions of the rules.

"This war will not end until there is Just Us!"

Ictentrid O'Reilly

The following table gives character and weapon data for both sides. All the Shot Accuracy values have been determined. To keep things simple, everyone except the NATO squad leader has the same Skill Level and Combat Actions. The players decide who will run the squad leader and who will run the Minimi.

		M16A1		M249		AKM47	
NATO Squad Leader		**Aim Time**	**Shot Accuracy**	**Aim Time**	**Shot Accuracy**	**Aim Time**	**Shot Accuracy**
Skill Level	5	1	-11	1	-17		
Skill Acc Level	11	2	-1	2	-7		
Combat Actions	6	3	2	3	0		
Knockout Value	35	4	4	4	2		
		5	5	5	4		
		6	6	6	5		
		7	7	7	7		
		8	8	8	8		
		9	9	9	9		
		11	11	11	11		
NATO Soldier / Russian							
Skill Level	2	1	-15	1	-21	1	-16
Skill Acc Level	7	2	-5	2	-11	2	-5
Combat Actions	4	3	-2	3	-4	3	-2
Knockout Value	10	4	0	4	-2	4	0
		5	1	5	0	5	1
		6	2	6	1	6	3
		7	3	7	3	7	4
		8	4	8	4	8	5
		9	5	9	5	9	6
		11	7	11	7		

"Listen...When I want your opinion, I'll tell you what it is."

Sgt. Ingram

The scenario begins as the Russians advance onto the bridge. There is a total of 48 Russians: 8 in two jeeps and 4 squads of ten on foot. Their only arms are the AKM47s (with two extra magazines each, AP ammunition). Their initial advance consists of one squad on point (one point man, 4 flankers, 5 bringing up the rear) and one of the jeeps with four men following. This group is moving at 1 hex per phase as it comes on board. The rest

of the Russians remain at the north end of the bridge, 20 hexes off board. To keep things simple, no firing on or off board is allowed (the referee could extend the map, however, drawing the bridge and far bank).

The NATO squad has had time to conceal their foxholes, so they will not be spotted until they fire.

The goal of the NATO squad is to incapacitate all 14 of the lead Russians on the first phase of fire. This would so demoralize the rest of the enemy that they would fall back and regroup. If this condition is not reached, the rest of the enemy will attack to support their comrades' retreat (the jeep can move 16 hexes per phase). This engagement will last 60 phases, after which the Russians fall back and regroup. Diehards can continue play at their own risk.

Scenario 2 Police Raid

"I think I'm allergic to war."

Din the Decisive

After a month of undercover investigation, the manufacturing center for a major drug ring has been located. Police have isolated the area and a SWAT team of ten men has been brought in. Police surveillance estimates the building occupants as three guards, two technicians, and one leader.

The manufacturing center is located in a building which has had all its windows boarded up. There are, therefore, no details of internal activity, but drawings and floorplans of the building have been pulled from city files and are available as shown on page 38. Possible entry points for the SWAT team are the doors and windows.

The SWAT team can be armed with UZI sub-machineguns, M16 rifles, or M870 shotguns and are equipped with Medium Rigid Body Armor. Their stats are given in the following table along with those of the suspects. The suspects are in normal clothing and are armed with M16 rifles and M92F pistols.

		Shot Accuracy		
SWAT Team	**Aim Time**	**M16**	**Uzi**	**M870**
Skill Level 6	1	-10	-11	-11
Combat Actions 6	2	0	0	0
Knockout Value 42	3	3	3	3
	4	5	4	5
	5	6	6	6
	6	7	7	8
Suspect Guard	**Aim Time**	**M16**	**M92F**	
Skill Level 5	1	-11	-6	
Combat Actions 8	2	-1	0	
Knockout Value 25	3	2	1	
	4	4	2	
	5	5	3	
	6	6	4	
Leader / Technician	**Aim Time**	**M16**	**M92F**	
Skill Level 3	1	-13	-8	
Combat Actions 7	2	-3	-2	
Knockout Value 21	3	0	-1	
	4	2	0	
	5	3	1	
	6	4	2	

Police Entry

The player running the police should choose his entry path or paths and divide his team up as he wishes. He will not know where the opponents are within the building.

To force a door or window, one policeman must use a sledge or equivalent device to force entry. His chances of forcing entry are 80% for a doorway, and 90% for a window. Forcing a door or window takes 1 phase and no movement or fire takes place in the first phase. Any door or window resisting entry can be hit again. Each try consumes 6 Action Counts. Once entry is established, police are free to enter and arrest the suspects. Don't forget that the police using the sledge must pick up their weapons and make sure to account for time to climb through windows (Table 7B).

The Suspects

At the end of phase 1 the suspects are placed in the building by a 0-9 roll. Roll a 0-9 for each suspect and place him on the appropriate numbered hex.

The suspects will be surprised by the raid and will not have their rifles ready. For each of them, roll a 0-9 number and refer to the following table to determine how many hexes away his rifle is. Place the rifle on the map randomly at the appropriate distance, using markers.

"Who died and made you Lieutenant?"

Sgt. Servo

Distance from Rifles

Roll	Guard	Leader	Technician
0	0	0	*
1	0	0	*
2	0	2	*
3-6	1	4	*
7	2	6	-
8	3	8	-
9	4	10	-

All the Suspects have a pistol on them which they may choose to use rather than their rifles. An asterisk in the Technician column indicates they are armed with a pistol and will use it. A dash (-) indicates they will flee and surrender if cornered or ordered to freeze.

Police Custody

Police entering the building will be confronted by a number of people; some armed, some fleeing, etc. Assume it takes 1 AC to determine if a person has a drawn weapon. If armed we would suggest you assume he will use it.

For a police officer to tell a suspect to "Freeze" costs 2 AC. Once he has frozen, it costs 3 AC to tell him to drop his weapon and for him to comply. At this point the suspect can be searched and handcuffed, but that will take essentially forever. To move a prisoner at gunpoint takes 4AC per hex, but allows an officer to remove a prisoner from the building.

Stray Fire

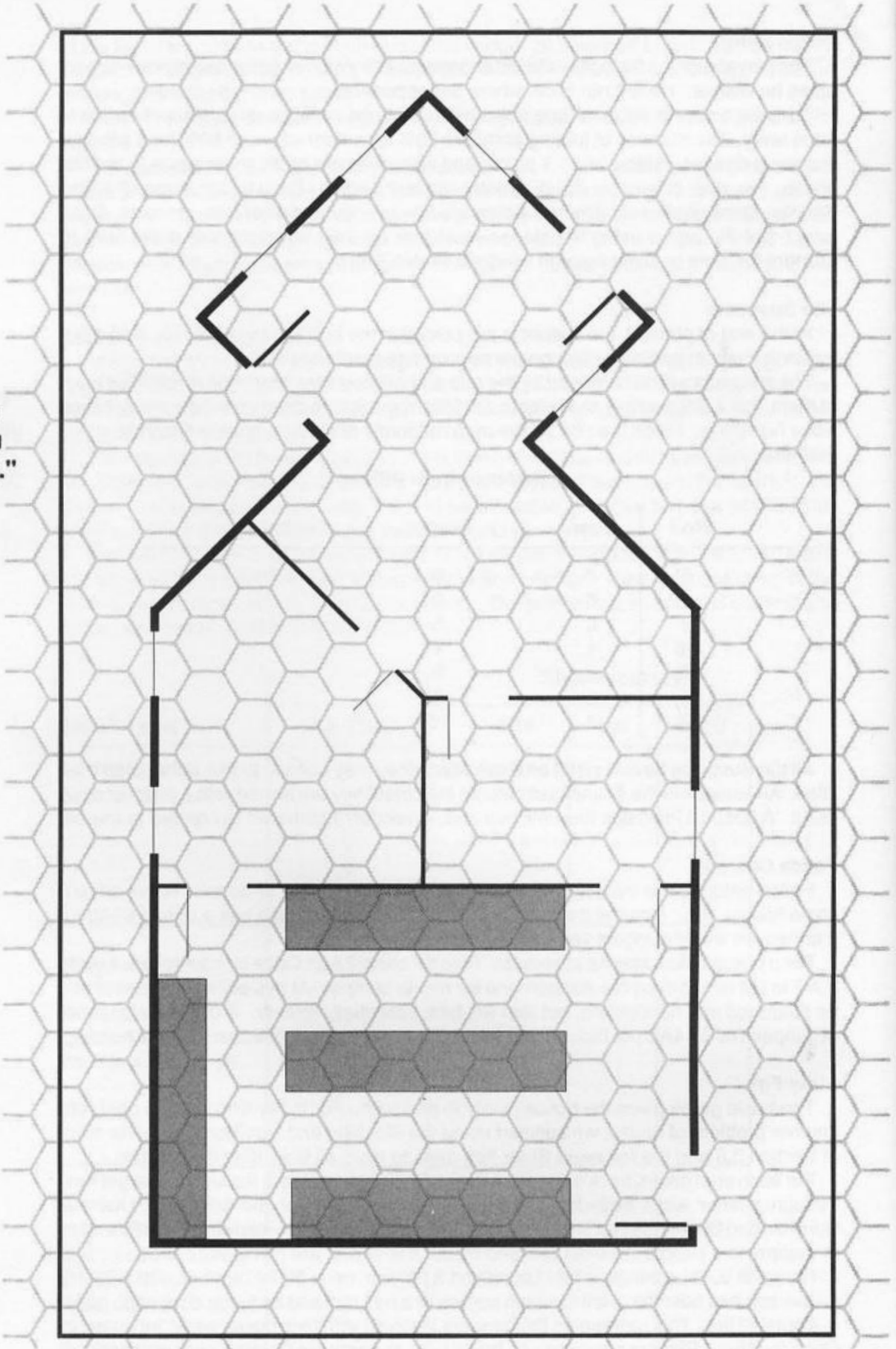
The basic game gives the police plenty to play with. For those who want to deal with another problem of reality, we suggest using the Blocking and NonBlocking Cover rules of Section 3.8 and the following Stray Fire rules to track all fire within the building.

For each shot taken, track a line from the hex the shot was fired, through the target hex, through interior walls and doors, and to an exterior wall of the building. Use the NonBlocking Cover rules for fire crossing walls and doors with the following Blind Fire rules to determine if people in hexes crossed by the line of fire are hit by stray shots.

For each bullet crossing a hex containing a person, roll a 00-99 number. On a 00-16, the person has been hit. Roll for each person in a hex crossed by fire and for each bullet in a burst of fire. This represents the dangers involved with high power weaponry used in close confines. Players may also use these rules to spray fire through walls and doors at unseen opponents.

"All my work is guaranteed for life, or you get your money back."

Dr. Oscar Sneiderbunk



Scenario 2: Police Raid

THIRD EDITION PHOENIX COMMAND

Third Edition Phoenix Command contains many product improvements. These are listed below to help players familiar with the 1st and 2nd editions find rule modifications and improvements.

Basic Combat System (Chapter 2)

A Basic Combat System has been added to introduce players to the **Phoenix Command** system and provide a fast and easy system for role-playing use. It maintains a high degree of realism, yet minimizes the work load on player and referee.

Game Flow (Section 1.3, 2.1, 2.2)

Game Flow within each Phase now takes place on an **Impulse** basis; with 4 Impulses per Phase. This system greatly improves resolution and deletes the need for the Target Visibility Table.

Ducking (Section 2.5, 3.1)

A -5 ALM Ducking or Appearing ALM has been added to account for target motion as he appears or ducks out of sight.

Movement ALM (Section 3.1)

The Moving Shooter and Moving Target ALMs have been expanded to include aim time restrictions, and the tables have been modified.

Field of View (Section 2.3, 5.1)

Field of View with the weapon at the ready, in a Firing Stance, and during Pinning Fire are defined.

Shock Points (Section 3.3)

The Shock Effects of broken bones have been included in the updated Damage Tables to more accurately simulate the incapacitating effects of Disabling Injuries.

"Once you've pulled the pin out of Mr. Grenade, he is no longer your friend."

Sgt. Servo

Automatic Shotguns and Grouping Pellet Hits (Section 3.5)

Rules defining the use of fully automatic shotguns and for grouping pellet hits have been included.

Explosive Weapon and Grenade Accuracy and Scatter (Section 3.6)

New rules for explosive weapon accuracy, thrown grenade accuracy, and scatter have been included.

Knockdown (Section 5.12)

A Knockdown factor has been defined which determines whether a projectile knocks a target off balance or off his feet.

Pinning Fire and Cover Fire (Sections 5.9 and 5.10)

Pinning Fire Field of View has been included along with rules for Cover Fire.

Single and Double Action Revolvers (Section 5.11)

Rules defining the use of single and double action weapons have been included.

Spotting and Sound Detection (Sections 5.2 and 5.3)

The Spotting and Sound Detection rules have been improved.

Effects of Incapacitation (Section 5.13)

Levels of Incapacitation have been defined.

USING PHOENIX COMMAND

Phoenix Command has been designed as a dual-purpose game. It may be used as a man-to-man modern wargame which requires no other rules, or it may serve as a combat system within another game, usually role-playing. The following are just a few ways in which this system can be used.

Using Phoenix Command as a Stand-Alone Wargame

Phoenix Command is an ideal framework for modern, man-to-man level wargaming. The referee simply chooses a scenario, whether from reality, a book, or a movie, and draws up a battle map. Pregenerated troops may be used, or custom characters can be created. Appropriate weapons and equipment are assigned to each character and teams are drawn from available players. The referee then briefs each team, and the game begins. The referee controls game flow and has authority to settle disputes. The two sample scenarios of Section 4.2 are simple examples of the type of games which can be played.

Using Phoenix Command with other Games

Phoenix Command makes a ideal combat supplement for other games, especially for. players who wish to add more realism to their gaming. The rules of Chapter 1 provide guidelines for adapting other games to **Phoenix Command**. Players make this conversion and use **Phoenix Command** for combat, medical aid, and wound recovery. Players are encouraged to use only the parts of **Phoenix Command** which suit their style of play. This might mean using the **Phoenix Command** Odds of Hitting but staying with their other game's damage system. In these ways, **Phoenix Command** can be tailored to your own needs, and will greatly expand your gaming experience.

"I must be doing something right. Not everyone here is dead."

Dr. Oscar Sneiderbunk

Using Phoenix Command with other Leading Edge Games

All **Leading Edge Games** products have a combat system similar to or simpler than **Phoenix Command**, and are designed to be completely compatible with it. All weapons and rules that are a part of the **Phoenix Command** line may be used in combination with any **Leading Edge Games** product.

Additionally, all equipment and rules supplements to other **Leading Edge Games** products can be used with **Phoenix Command**. This expands **Phoenix Command** play to include any level of technology or role-playing venue.

Phoenix Command Tournament Rules

The **Tournament Rules** are designed to allow players to throw together a pick-up game, as well as for actual tournament play. A simple point system is used to balance the game, and tactical skill and knowledge of weaponry are the keys to victory.

Teams may be assigned, or the battle may be a free-for-all. Unless it is a friendly pick-up game, it is recommended that one person be the referee, and control game flow. A map which is acceptable to all concerned is used, or is drawn up. Players may be placed on the map at random, or assigned a **Baseline** - a specific point of entry.

Players may choose to have characters who are incapacitated or killed reenter, unwounded, at their team's Baseline, to create an endless battle.

Each player receives 58 points per combatant. These are used to "buy" characteristics, skill levels, armor, and weapons. Points may not be shared between characters or players.

Characteristic points cost one point each, and no characteristic may be less than six.

Combatants are base 3rd **Skill Level**, and each extra level costs 3 points. For example, 5th level costs 6 points.

Body Armor costs 1/2 the PF, rounded up. Heavy Flex costs 5, for example. Helmets costs 1 for Rigid or lighter, 2 for heavier.

Weapons cost are found on the following table. The only limit on the number of weapons which may be taken is the character's point total. All ammunition is FMJ, or HEAT for explosives.

Weapon Costs

Weapon	Cost
Machine Gun, Grenade Launcher	6
Automatic Rifle or Automatic Shotgun	4
Sub-Machinegun*, Anti-Tank weapon or RPG	3
Non-Automatic Rifle or Shotgun	2
Pistol, Hand Grenade, or 1 Reload	1

* The HK53, AKR, and Bushmaster are actually Sub-Machineguns, but cost as much as Automatic Rifles.

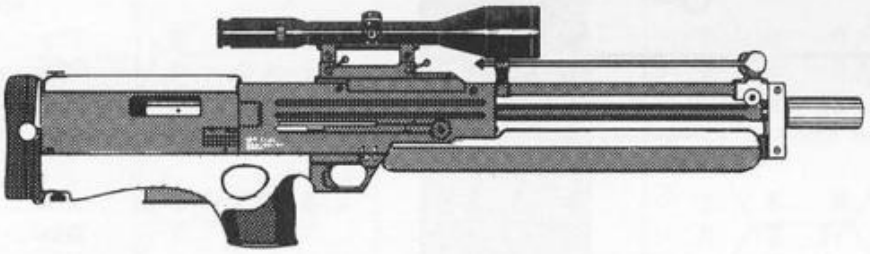
"Listen, Lieutenant; No food, No fight."

Sgt. Servo

Each character earns **Victory Points**. The single character with the highest total is the individual winner. Add up the individual's totals for each side to decide which team wins.

Victory Points

3	points for killing or incapacitating an opponent
1	point for a disabling wound to an opponent
0	points for any other wound on an opponent
-3	for being killed or incapacitated
-1	for leaving the playing field disabled
-2	for leaving the field undisabled, anywhere except the opponent's Baseline
+4	for leaving the field undisabled on the opponent's Baseline



5 OPTIONAL RULES

These optional rules allow the player to more accurately simulate combat; certain details left out of the basic game are included here, as are rules covering special situations. Any or all of these rules may be added by agreement of the players.

5.1

EXPANDING THE FIELD OF VIEW

In the basic game, a character's **Field of View** is his front 180 degrees. He may respond to any threat in this front 180 degreesbut he cannot see or react to a threat coming from behind. There are times, however, especially in close combat, when a character will not know in which direction the threat will come. In these cases, he can increase his Field of View by glancing to the side or rear. These glances take time. Increasing his Field of View to 240 degrees decreases his Combat Actions by 1, increasing it to 300 degrees decreases his Combat Actions by 2, and increasing it to a full 360 degrees decreases his CA by 3. Note that a character may not increase his Field of View when in a Firing Stance or if using the Pinning Fire rules of Section 5.9.

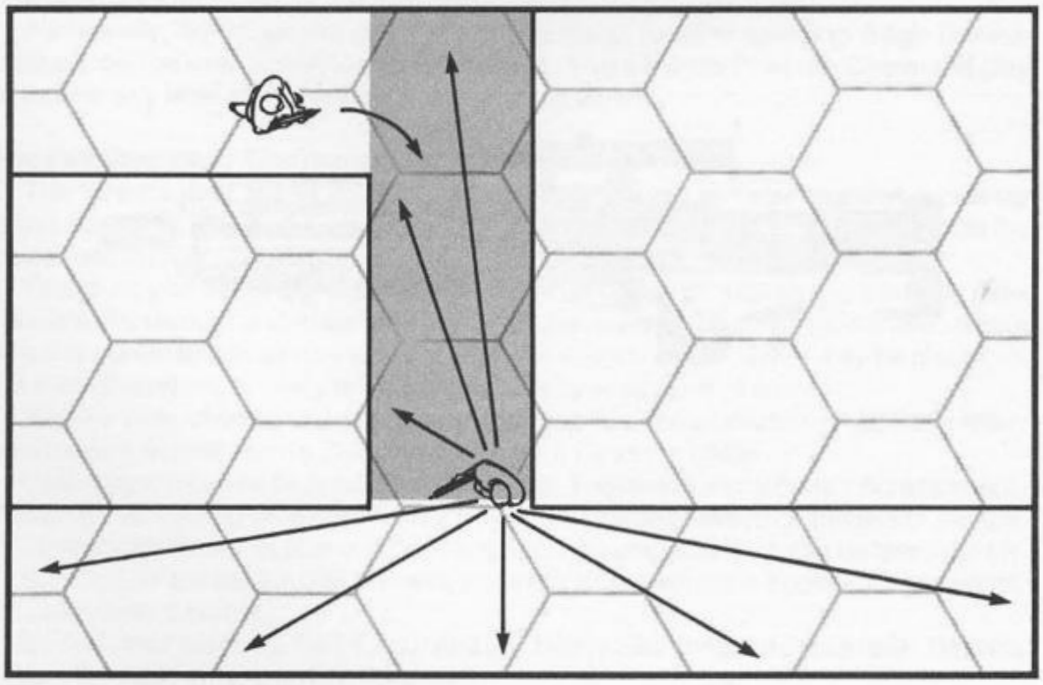


Figure 7: Expanding the Field of View

Example:

Donovan, whose CA = 5, is in a building and has lost contact with his comrades. He hears gunfire and motion in adjoining rooms and hallways. Confused, he decides to stay put and remain on the defensive. He is standing at the "T" of a corridor and, fearing attack from any direction, increases his Field of View to 300 degrees (2 point penalty) as shown in Figure 7. This leaves him an effective CA of 3 and means he receives an action on the 1st, 3rd, and 4th Impulse of each phase. Seconds later, an opponent runs around the corner behind Donovan. Donovan spots the opponent in his increased Field of View, changes Facing 120 degrees (1AC) on the first Impluse of the phase, and fires a Snap Shot (1AC) on the third Impulse of the phase.

SPOTTING

In the basic game, it is assumed that anyone within the character's line of sight is immediately seen. To add more realism the following **Spotting Rules** may be used to determine the time required to spot a target.

These basic Spotting Rules give the **Spotting Time**, in Impulses, required to spot a target. They are intended for close combat and depend on whether the target is **Moving**, stationary but **Using Combat Actions**, or stationary and **Frozen**. A Moving target is someone or something which is physically in motion on the play field. A stationary target using CA is someone who is not Moving, but is using CA for aiming, reloading, or any other physical action. A stationary target who is Frozen is someone who is not using any CA for any action other than those which do not require physical motion, such as spotting and communication. Movement of the eyes or lips is not considered "physical motion" in this sense.

To use these rules, simply enter the following **Spotting Time Table** for the appropriate terrain type. Tables are given for No Cover, a flat surface such as a parking lot; within a Town; Hilly terrain with cover, and Jungle or Heavy Brush. Simply enter the appropriate table cross-indexing the target range in hexes with the target's Motion and Target Size ALM. (Round Target Size ALM down) This gives the Spotting Time.

Range	Target Size 8, 4, or 0								
	Moving			Using CA			Frozen		
	8	4	0	8	4	0	8	4	0
No Cover									
<10	0	0	0	0	0	0	0	0	0
<20	0	0	0	0	0	1	2	5	8
<40	0	2	2	2	2	3	12	24	33
Town									
<10	0	0	0	0	0	1	2	5	8
<20	0	0	1	0	2	2	5	12	17
<40	2	2	3	2	5	8	24	45	54
Hill									
<10	0	0	1	0	2	2	5	12	17
<20	0	2	2	2	2	3	12	24	33
<40	2	5	8	5	12	17	45	68	137
Jungle									
<10	1	2	3	2	3	5	17	33	45
<20	2	3	5	3	8	12	33	54	68
<40	8	17	24	17	33	45	137	275	275

"Listen, Lieutenant, we either do it my way or I'll have to shoot you."

Sgt. Servo

Example:

Donovan is advancing down an alley. There is a sniper Frozen in a window 30 hexes away. Donovan's Spotting Time is found on the Town terrain table at range 40, for a Frozen target of Target Size ALM = 0 (in firing stance) and is 54 Impulses.

The sniper has been watching the alley and spots Donovan in 2 Impulses. After that time he starts to bring his rifle to bear. He is now stationary using CA, so Donovan's Spotting Time is now 8 Impulses. This is not a good situation to be in, but gives an indication of why Town fights are unpopular.

Pinned Spotting

The preceding rules give the Spotting Time to pick up a new target. Once the character has spotted a target it is much easier to spot him a second time. For basic play, a three hex convention is used for second spotting. In other words, once a target is spotted, the character can respot any target within one hex of the same location with a Spotting Time of 0. This is **Pinned Spotting**; the position is pinned and the spotter knows where to look. This is one of the main reasons it is advisable to keep moving in combat. Once the enemy has a position pinned, they can effectively bring fire to bear without a spotting time penalty.

Character Ability and Spotting Time

The preceding rules give the Spotting Times for an average soldier whose CA = 4. The Spotting Time can be considered in Action Counts with the character's Spotting Time based on his Combat Actions. This more closely corrects the Spotting Time for skill and experience. For the purist, the Spotting Time should be read in Action Counts, and the character's CA for spotting should be taken off **Table 1D** for a Maximum Speed (MS) of 4 versus his Intelligence Skill Factor (ISF). This separates the character's strength and encumbrance from the spotting time and depends only on his intelligence, or quickness of thought, and skill. For those using our role-playing games, the SAL used in determining the ISF should be based on his Traps and Spotting Skill Level.

5.3

SOUND DETECTION

In many situations a character must rely on his hearing to warn him of approaching danger. The following **Sound Detection** rules give the chance of hearing various noises based on situation and conditions.

To determine the chance of detecting a sound, enter the following **Sound Magnitude Table** to find the **Sound Magnitude (SM)** of the noise the character is trying to detect. The greater the SM, the louder the noise. This SM is adjusted for conditions such as range, wind, background noise, and the listener's attention. To make these adjustments, simply enter the following tables, as appropriate, and add the sound modifiers to the SM. These sound modifiers include:

Range

Correction for noise level as a function of distance from the source.

Intervening Factors or Conditions

These modifiers adjust the SM for air conditions, intervening cover such as doors or brush, and general terrain conditions.

Background Noise

These modifiers adjust the SM for the background noise level at the listener's position. If the Background noise level is much louder than the sound, he will not be able to detect it. Note that the Background Noise level is the average continuous noise present when

the listener is trying to hear the sound. Loud bursts of background noise such as cheers from a crowd will only be effective during the time they are present .

Listener Attention

These modifiers adjust the SM for the listener's condition of alert and readiness.

Once the **Effective Sound Magnitude (ESM)** is determined by adding all appropriate modifiers to the basic SM, enter the **Sound Detection Table** with this ESM to find the chance of detecting the sound. The listener rolls a 00-99 number. If less than or equal to the detection chance is rolled, the noise is heard. For single noises such as a gunshot, the listener gets only one roll for detection. In the case of a continuous noise, the listener receives one roll each phase.

"My loyal troop... you've come back to save me!"

Captain Stora

"Actually, sir, we came back for your gun..."

Gil the Treacherous

Sound Magnitude

Weapon Fire		**Weapon Fire**	
Pistol or SMG		Grenade Launchers	103
Small Caliber	102	Rocket Launchers	140
9mm	105	Lase Rifle	70
Magnums	107	Gauss Rifle	95
Silenced Pistol / SMG	60	Slivergun / Flechette	110
Rifles, MG, or Shotguns	110	Rocket Rifle	120
Conversation		**Alarms**	
Whisper	20	Telephone or Door Bell	83
Single Voice	45	Dog Bark	88
Small Group Conversation	55	Whistle	90
Loud Conversation	65	Megaphone / Alarm	100
Shout	85	Air Raid Siren	125

Combat Actions	**Using Normal AC**	**Using x10 AC**
Weapon Action		
Automatic Pistol or SMG	59	26
Automatic Rifle or MG	60	27
Shotgun	62	29
Bolt Action Rifle	58	25
Cock Revolver	57	24
Insert Magazine	45	22
Open Velcro Pocket	56	20
Open Door Latch	57	15
Wire Cutters	45	15
Bolt Cutters	55	25

Movement and Actions		**Terrain Modifiers**	
Grenade Landing	53	Grass / Sand / Carpet	0
Person Moving		Moist Earth	+3
Creep 1 / 4 HPP	20	Hard Ground (dirt)	+8
Stalk 7 HPP	26	Gravel	+11
Walk 2-3 HPP	43	Brush	+12
Trot 4 HPP	56	Leaves	+13
Run 5+ HPP	58	Hard Surface	
Jump to Ground (6-10 foot)	65	Soft Sole	0
Body Falling to Ground	50	Hard Sole	+8
Dropped Weapon	70	Metal Sole	+14

"Just another tragic case of terminal kinetic energy poisoning."

Dr. Buen-Scheuk

Range Modifier

Range	Mod	Range	Mod	Range	Mod
0	0	16	-30	260	-54
1	-6	23	-33	360	-57
2	-12	32	-36	510	-60
3	-16	45	-39	1000	-66
4	-18	64	-42	2000	-72
6	-22	90	-45	3000	-76
8	-24	130	-48	5000	-80
11	-27	180	-51	15000	-90

Intervening Factors and Conditions

Outdoors	0
Indoors	+3
Direct Line of Sight	0
Isolated from Sound	
Through Brush	-2
Interior Wall / Door	-4
Light Exterior Wall / Door	-10
Medium Exterior Wall / Door	-12
Isolated from Sound	
Heavy Wall / Door	-18
Solid Cover (bunker)	-26
Wind	
None	0
Low	-1
Moderate	-3
High	-6
Gale Force	-9

Background Noise

Wind	
Low	-10
Moderate	-20
High	-35
Gale Force	-60
Water	
Ocean Surf (Pacific)	-20
White Water Stream	-40
White Water Rapids	-70
Conversation	
Whisper	-20
Normal Voice	-45
Small Group Conversation	-55
Loud Conversation	-65
Shouting	-85
Movement (Walking On)	
Grass / Sand / Carpet	-43
Moist Earth	-46
Hard Ground (dirt)	-51
Gravel / Brush	-54
Leaves	-56
Hard Surface (soft sole)	-43
Hard Surface (hard sole)	-51
Miscellaneous	
Urban House at Night	-18
City Street at Night	-20
Air Conditioning in Building	-30
Outdoor Crickets	-35
In House off Busy Street	-40
In a Jet Aircraft	-50
On a Busy Street	-70

Listener Attention

Sleeping	-20
Critically Preoccupied	-3
Preoccupied	-1
Normal Alert	0
Expecting Alarm	+2
Focused Attention	+6
Fired Weapon Recently	-6
Using Directional Sound Amp.	+24
In Power Armor	+20

Sound Detection Chance

ESM	Chance	ESM	Chance	ESM	Chance
10+	99	5	88	0	8
9	98	4	82	-1	2
8	97	3	72	-2	2
7	95	2	50	-3	0
6	92	1	20	-4	-

Example:

A group of guards are playing a lively game of poker inside a light frame house. It is cold outside, so the windows and doors are closed. Outside a guard dog barks at an intruder 6 hexes away. The guards' chance of hearing the dog is based on a ESM of 88 (dog bark) - 22 (range 6 hexes) + 0 (no wind) - 10 (isolated by light wall) - 55 (background small group talking) - 1 (listeners preoccupied) = 0. Each guard's chance of hearing the dog is 8 per cent per phase.

5.4

DEFENSIVE SKILLS

The basic game does not account for the character's defensive skills. A skilled opponent, who is aware of a threat, will be a harder target to hit than an unskilled one. The skilled opponent will present a smaller target area and know how best to use cover and movement to elude fire.

The following presents a **Defensive ALM** based on the target's Intelligence Skill Factor (ISF) of Section 1.3, Step 6. This Defensive ALM is added to the Effective Accuracy Level (EAL) of all shots fired at the character.

Defensive ALM

ISF	Defensive ALM	ISF	Defensive ALM	ISF	Defensive ALM
3	+16	10	+5	20-22	-2
4	+13	11	+4	23-24	-3
5	+11	12	+3	25-27	-4
6	+10	13-14	+2	28-30	-5
7	+8	15-16	+1	31-34	-6
8	+7	17	0	35-38	-7
9	+6	18-19	-1	39-40	-8

5.5

INITIATIVE

In a combat situation, **Initiative** and **Morale** have probably the most important role in determining a combatant's overall effectiveness. In the Basic Game, the combatants react as perfect automatons. Their Combat Actions determine the speed with which they can perform any act, but not a moment is lost pausing to think,and not an instant is wasted. In reality, only the perfect soldier would be capable of such action. The following presents a simple way in which game flow can more accurately represent real people in combat.

Each player must decide what **Course of Action (COA)** his character will follow. A Course of Action is a planned series of actions such as: 1) advance to window, 2) kneel, 3) establish a firing stance out the window. The number of actions a character may

perform during a COA is limited to the **Action Number (A#)** defined below. The time, in Action Counts, required to think of this COA is given by the **Initiative Time (IT)**. After IT Action Counts required to think, the character embarks on the COA.

The Initiative Time (IT) and Action Number (A#) are found on the following **Initiative Time Table** opposite the Intelligence Skill Factor (ISF) of Section 1.3, Step 6.

**"See Squid fight.
See Squid get scared.
See Squid run away
and abandon his
friends.
Don't be a Squid."**

Death Bunny

Initiative Time Table

ISF	IT	A#	ISF	IT	A#	ISF	IT	A#
3	32	2	8-10	20	3	21-28	8	5
4-5	28	2	11-14	16	3	29-39	4	6
6-7	24	3	15-20	12	4	40+	0	7

Example:

Donovan has an Intelligence Skill Factor of 21. This means his Initiative Time (IT) = 8 and Action Number (A#) = 5.

Donovan has just entered a building and is hiding around the corner of a corridor. Somewhere down the corridor is a room from which an opponent is firing. He decides to peek around the corner and duck back. This decision takes 8 AC. So, 8AC later he looks around the corner (1AC), then ducks back (1AC).

Donovan saw an empty corridor with two doors. The first door seems to be the one from which he hears gunfire. He decides to set down his rifle, arm a grenade, draw his pistol, run down the corridor (2 hexes), and toss the grenade through the door; a total of 5 separate Actions. This Course of Action takes him 8AC to devise. So after 8AC, he proceeds with his plan.

The preceding example shows how the Initiative Time (IT) is used. While a character is pausing to think, he is free to use those AC changing facing or stance, reloading, or any other action which would not expose him to fire or interfere with his thinking.

Once a Course of Action is started, it cannot be canceled until at least 1AC is spent. A character may, however, respond immediately to any threat. For example, if an opponent had jumped Donovan while he was thinking, he could immediately respond to this threat. The IT applies only to the time required to think of his own Course of Action (usually offensive), not immediate threat response. If a character is interrupted during the performance of a Course of Action, he may immediately respond, and then, without penalty, continue on his COA. He cannot, however, alter his plans in midstream without pausing for IT AC. If it is not safe to pause for IT AC, he can immediately flee to the nearest cover and reconsider from relative safety.

Example:

Donovan has Combat Actions = 5 and embarks on the Course of Action determined in the preceding example. In the 1st phase, he sets down his rifle (4AC) and starts to grab a grenade (1AC of 4). In the 2nd phase, he finishes grabbing the grenade (3AC) and starts to arm it (2 of 3AC). In phase 3, he finishes arming the grenade (1AC), draws his pistol (2AC), and moves 2 hexes down the corridor (2AC). In Impulse Four of Phase 3, Donovan moved one hex down the corridor. At the same time an opponent entered the corridor from the far end. Neither Donovan nor the opponent had any extra Combat Actions in the fourth Impulse so each spots the other, but no shots are fired.

On the first Impulse of Phase 4, both Donovan and the opponent exchange Snap Shots. Both their actions were immediate, taking place 1AC into Phase 4. Donovan incapacitates his opponent, while the opponent misses. Donovan can now either wait IT = 8AC and change his plans or proceed without further delay. Donovan proceeds and tosses the grenade into the room (2AC).

The preceding rules have a very important aspect: a squad leader or commander can relay orders to his troops in exactly the way he would plan his own actions. If well disciplined, they will respond and a preplanned, coordinated attack can be initiated. Once the plan is completed or interrupted, the troops must rely on their own initiative.

Players should realistically model the time it takes a leader to relay his orders. A complex set of instructions could take minutes to communicate. Once coordinated and positioned, the leader can give the go signal, and all troops will jump to action. Once this preplanned Course of Action is accomplished, the leader should reassemble his unit, evaluate the situation, and give new orders. For basic orders, you may assume it takes 2 times the leader's IT to issue each order. Therefore if a leader with IT = 8 were to give orders to 4 maneuver elements, the time required would be 2 x 8 = 16 AC per order x 4 orders = 64 AC. For leaders with an ISF of 40 or more, assume an IT of 4 for giving orders.

Combat now takes place on a more realistic time line. There will be minutes of silence as each side coordinates and plans, followed by intense action. The unit with fastest IT will be able to keep up the pressure and remain on the offensive. An ill led unit with long IT will be unable to go on the offensive and will be forced to respond to the enemy's attacks.

5.6

MORALE

Whenever someone is being shot at, the natural response is to seek cover. A character will remain exposed to fire (either moving or returning fire) only as long as a shot does not come too close to his position; a character's **Critical Distance** determines how close this might be. The Critical Distance depends on his Knockout Value and is found on the following table.

Critical Distance Table

Knockout Value	Critical Distance	Rally Time	Knockout Value	Critical Distance	Rally Time
1-4	6	160	30-39	2	20
5-9	5	120	40-49	1	8
10-19	4	80	50-79	1	4
20-29	3	40	79 +	1	0

Whenever a shot or automatic fire burst elevation roll misses a character, the shooter should find the EAL with Odds of Hitting just larger than the number rolled. If the difference between this EAL and the EAL required to hit is greater than the Critical Distance, the target is unaffected by the miss. If the difference is less than or equal to the target's Critical Distance, he must make a **Morale Roll.**

To make a Morale Roll, the character rolls a 00-99 number. If less than or equal to his Knockout Value (KV) is rolled, he is unaffected by the near miss. If greater than his KV is rolled, he must take cover (duck) or go to a **Low Prone** position. A Low Prone position is a defensive posture from which one cannot move or fire.

Once a character is under cover, he can attempt to make a **Tripled Morale Roll** (a roll less than or equal to 3 times his KV). If he makes this roll, he can reinitiate action. If he fails this roll, he will remain under cover until rallied or he comes under life threatening fire. If he comes under life threatening fire, he will either flee or surrender.

To be **Rallied**, another comrade who has not failed morale must enter the hex of the broken man and spend **Rally Time AC** bolstering his morale. The Rally Time is based on the unbroken character's KV and is found on the preceding **Critical Distance Table**. For each set of Rally Time AC spent rallying, each broken character in that hex is given another chance to make his Morale Roll. If he makes this roll, he has been rallied and is ready for action.

Example:

Donovan has a Knockout Value (KV) of 15 and, therefore, a Critical Distance of 4. If a shot with an EAL of 17 (Odds of Hitting = 46) is fired at him, and a 52 is rolled for the Odds of Hitting, the shot misses. The number just larger than the one rolled is for an EAL of 18. The shot, therefore, missed by 18 - 17 = 1 EAL. Since this near miss is less than or equal to his Critical Distance, he must make a Morale Roll. Donovan rolls a 67 and fails his Morale Roll so dives for cover behind a boulder. Once under cover, he attempts his tripled Morale Roll (3 times his KV of 15 = 45). He rolls a 48, failing his second roll.

A few phases later, Donovan's squad leader enters his hex and orders him forward. Donovan's squad leader's Rally Time = 8, so after his squad leader expends 8 AC rallying Donovan, Donovan may attempt another Morale Roll (roll less than or equal to his KV). He rolls a 09, making his roll, so can reinitiate action.

5.7

SHOT TIMING WITHIN A PHASE

In the basic game, play advances on an Impulse by Impulse basis and all fire is resolved at the end of each Impulse. There are times, however, when detailed timing is desired, especially in situations of near-simultaneous fire. The **Master Phasing Count (MPC)** resolves this.

The Master Phasing Count (MPC) gives the moment within an Impulse when each of the character's Action Counts are performed. It is graduated in tenths of a second (5 for an entire Impulse), and is found opposite the Combat Actions that Impulse on the following table.

Master Phasing Table

Combat Actions That Impulse	Master Phasing Count 1	2	3	4	5
1			X		
2		X		X	
3	X		X		X
4	X		X	X	X
5	X	X	X	X	X

Donovan, who receives 2 Combat Actions this Impulse, would look on the Combat Actions 2 line and find two numbers: 2 and 4. These are the times (in tenths of a second) during the Impulse he completes each of his two Combat Actions. If Donovan fires on his 2nd AC, he fires on MPC4 of that Impulse. If he fires on his 1st AC, he fires on MPC2.

Example:

Donovan and an opponent exchange fire down a corridor. Donovan, whose Combat Actions = 2 that Impulse, fires on his 1st Action Count. The opponent, whose CA = 1, also fires on his 1st Action Count. Using the Master Phasing Count, we see Donovan fires on MPC2 just before the opponent's shot on MPC3.

Players can now resolve damage in the order shots are taken, from the lowest MPC to highest.

If a character is shot during an Impulse when he is about to fire, and he is not disabled or knocked out, his shot is executed with an extra ALM modifier of -10 to his aim. If he fires before he is hit, there is obviously no penalty to his aim.

If he is disabled or knocked out, there is an ALM modifier of -20 to his aim if the shot is taken within 3 MPC after the time of the injury. Any shots which would have been fired more than 3 MPC after the time of a disabling injury or knockout are cancelled.

Example:
Donovan hits and knocks out his opponent on MPC2. The opponent was returning fire on MPC3. Since this shot occurs within 3MPC of the time of his knockout, it is resolved with an additional ALM = -20.

5.8

SECOND SHOT ACCURACY

Successive shots into the same area are obviously somewhat more accurate, and the Second Shot rule reflects this. A shooter who fires a second shot at a target in the same hex in which the first shot was fired receives a +1 AC bonus to his second shot's aim time. To receive this bonus, the shooter must remain stationary and may not have broken firing stance.

Example:
A stationary shooter spends 2 AC aiming and fires a second shot at a target in the same hex as the preceding shot without breaking firing stance. His second shot's aim time is the AC spent aiming plus 1, or 2 + 1 = 3AC.

5.9

PINNING FIRE

A location can be **Pinned** if the shooter is in a firing stance and elects to aim at that location. The location can be up to one hex wide, and is usually a clearly definable spot, such as a window or corner. If a target appears in the pinned location, the shooter adds 1AC to the aim time spent aiming after the target appears. A shooter can pin only one hex at a time and his Field of View is reduced to 10 degrees.

Example:
Donovan pins a window from which he expects an opponent to appear. Two phases later, an opponent comes into view. Donovan spends 1AC aiming and fires. His shot's aim time is 1 + 1 = 2AC.

5.10

COVER FIRE

Cover Fire is an effective way to drive the enemy under cover so that he is less of a threat. It is most effective with fully automatic weapons, but single shot weapons can also be used. Cover Fire is aimed at a hex, or hexes, and assumes a Target Size of +10. If the Cover Fire hits, then any opponent appearing in that hex, or hexes, comes under immediate attack. The chance of hitting is taken from the **Automatic Fire Hit Chance Table (5A)** for automatic fire based on the Rate of Fire and Arc of Fire. For single shot fire, each round hitting the hex has an 11% chance to hit.

Example:
To cover a comrade's approach to a building, Donovan fires a burst of automatic fire from his M16 into the windows of the building. The windows are contained in an Arc of Fire of 3 hexes and Donovan's fire is accurate. During the Impulse, an opponent appears in the window and is attacked by Donovan's Cover Fire. Donovan's Hit Chance is taken from Table 5A with an Arc of Fire of 3 and Rate of Fire of 7 and is a 29. Donovan rolls an 18 and hits the opponent.

5.11

SINGLE AND DOUBLE ACTION WEAPONS

Revolvers and other pistols are available with either Single or Double Action triggers, depending on the weapon. A **Single Action** weapon's hammer must be manually cocked before firing each round, while a **Double Action** weapon can be cocked and fired with a single stroke of the trigger. This trigger stroke is much longer and stiffer than that of Single Action fire, and consequently impairs accuracy. Double Action weapons can be fired in the same way as Single Action weapons if the firer wishes.

Single Action weapons have a ROF of 2; in other words, it takes two AC to cock the weapon for a second shot. Double Action weapons have a ROF of 1. The basic Odds of Hitting assume weapons are being fired from a cocked position, or Single Action fire. If the shooter chooses to fire his weapon Double Action, his aim would have an additional -3 ALM applied. This penalty accounts for the long trigger stroke and greater amount of pressure required for Double Action fire. Note that the Rate of Fire applies only to a second or subsequent shot, but that the accuracy penalty applies to even a first shot.

Examples:

Axly is firing a Double Action revolver with a Rate of Fire of 1. He has just fired a shot and wants to continue firing as fast as possible. So, his next shot takes 1 AC to prepare and 1 AC to aim and fire. This shot would have an additional aim penalty of -3 ALM. If he had wanted to cock his revolver before firing, it would take him 2 AC to cock (Single Action fire), and 1 AC to aim and fire.

Donovan has just drawn his automatic pistol. The pistol has a round in the chamber with the hammer down. Donovan can either spend 2 AC to cock the hammer, or leave it down for Double Action fire. If he cocks the hammer, his shot would have no accuracy penalty. If he Double Action fires, his shot would have an accuracy penalty of -3 ALM. Because this is his first shot, the Rate of Fire does not apply. In other words, Donovan could fire his pistol after 1 AC of aim without having to spend 1 AC for Double Action fire.

5.12

KNOCK DOWN

In addition to the injuring effects of bullet wounds, knock down is a factor. This is particularly important in cases where the target is in body armor. The armor can stop the projectile's penetration but may result in the target being knocked off his feet. The **Knock Down (KD)** value of a weapon measures its knock down ability and is found in the **Weapon Data Tables.** To determine if a target has been Knocked Down simply cross-index the weapon's KD value with the Hit Location on the following **Projectile Knock Down Table.** If the KD is greater than or equal to the entry, that level of Knock Down effect is imposed on the target. These penalties range from a 1 to 4 Action Count penalty, to the target being knocked off his feet. The AC penalties represent the target being knocked off balance and represent the time required for him to regain his balance before he can take any action. The Knock Down result is just that; the target is knocked off his feet. It takes 1 Impulse for him to hit the ground during which he can take no actions. Once he hits the ground, it takes 3AC for him to roll into a position in which he can use his hands. From there, it takes another 3AC for him to rise to his feet or 2AC for him to rise to his knees.

Projectile Knock Down Table (PEN)

Penalty	Head	Body	Arm	Leg
-1 AC	2	11	2	3
-2 AC	3	14	3	4
-4 AC	4	17	4	5
Knock Down	10	19	16	6

Example:

Axly is hit in the head by a pistol whose PEN is 3. Luckily Axly was wearing a helmet which stops the bullet's penetration. The impact, however, causes him a 2 AC penalty as shown in the Projectile Knock Down Table.

Explosive Knock Down

Explosions also have Knock Down effects and are given in the following **Explosive Knock Down Table**. This table is used in the same fashion as the Projectile Knock Down Table, except the explosion's **Base Concussion (BC)** is cross-indexed with the target's armor type. Power Armor is an advanced high-tech exoskeleton used in the **High-Tech Weapon Data Supplement** and in our role-playing systems. It comes in three configurations; Light, Medium, and Heavy.

Explosive Knock Down Table (BC)

Penalty	Normal Infantry	Power Armor Light	Med	Heavy
-1 AC	50	270	520	770
-2 AC	66	350	700	1020
-4 AC	82	440	860	1260
Knock Down	90	480	950	1390

Example:

Axly is running over open terrain when a grenade explodes 2 hexes away. The blast causes him 52 PD in Concussion Damage. In addition to the wound,he is penalized 1 AC as shown on the Explosive Knock Down Table for a blast of BC = 52.

INCAPACITATION EFFECTS

In the basic game once a character has failed his Knockout Roll he has been Incapacitated. This incapacitation does not necessarily mean he is unconscious, it simply means he is out of action. The following **Incapacitation Effects Table** defines the various levels of Incapacitation, which can be used to define the character's potential actions following Knockout. To use this table, simply cross-index the **Knockout Roll** with the PD Total to determine the Incapacitation effects.

Incapacitation Effects Table

PD Total	Knocked Out	Stunned	Dazed	Disoriented
over 1/10 KV	00-00	01-02	03-05	06-09
over KV	00-02	03-08	09-16	17-24
over 2 x KV	00-13	14-31	32-52	53-74
over 3 x KV	00-26	27-53	54-82	83-97
200+	00-60	61-94	95-96	97-97

Knocked Out

The character is unconscious. The time he remains unconscious is taken from the **Incapacitation Time Table (8B).**

Stunned

The character is semi-conscious but incapable of action or coherent thought. Incapacitation Time is taken from **Table 8B.**

Dazed

The character drops to the ground conscious but incapable of offensive action or thought. After 1 Impulse, a dazed character may flee to cover and take non-offensive actions at 1/2 normal CA. His Incapacitation Time is taken from **Table 8B** with a -1 modifier to the 0-9 roll.

Disoriented

The character is fully functional except for Disabling Injuries and may flee or duck to save himself. He is incapable of offensive action and may not advance toward the enemy. His Incapacitation Time is taken from **Table 8B** with a -2 modifier to the 0-9 roll.

Example:

Axly has just taken 52 PD from a grenade blast. This puts his PD Total at Over 2 X KV. Axly rolls a 28 for his Knockout Roll and is Incapacitated. Referring to the Incapacitation Effect Table, he has been Stunned by the blast and drops to the ground incapable of action. Axly rolls a 2 on his 0-9 roll to determine his Incapacitation Time. Entering Table 8B, his Incapacitation Time is 15 Phases.

5.14

HERO RULES

Historical accounts of men in combat often refer to actions in which a man is seriously injured but remains in action. His wounds would clearly incapacitate a normal man and are outside the bounds of a high Knockout Value. This type of phenomenon is similar to what happens when a bear charges a hunter and can be shot repeatedly with little effect. It is tied to the adrenalin rush common to beasts of prey.

To model this phenomenon, the following rules may be used. Whenever a combatant takes wounds which push him over 3 X KV on an Impulse he is charging the enemy, or is aggressively moving to the aid of a comrade, and he makes his knockout roll with a 98-99 roll, he has moved into the realm of the adrenalin rush. For all further Impulses, his Knockout Roll is based only on the PD received that Impulse; the PD Total is ignored. This means if he is hit again on the next Impulse for 15 PD, his knockout roll would be based on a PD Total of 15. This continues until he fails another knockout roll or he exceeds his **Critical Time Period** (Section 2.9). Characters in this situation are only affected by double asterisk (**) Disabling Injuries.

These rules apply only to characters whose Knockout Value is naturally greater than or equal to 40. Note also that on the Impulse the character makes the 98-99 knockout roll to start the process he is knocked down and must get up.

Example:

Trent, whose KV is 48, leaves cover to go to the aid of Axly who has been Incapacitated in the open. As Trent gets to Axly he is hit in the leg and suffers a 200 PD double disabling injury. The 200 PD wound makes Trent's PD Total Over 3 x KV. Trent rolls a 98 for his Knockout Roll meaning he is not Incapacitated. He is however Disabled by the leg injury. Trent remains in action and drags Axly to cover. Over the time it takes him to get to cover he is hit again in the leg by a Glancing hit. This hit does another 11 PD. Because Trent has made his 98-99 Knockout Roll and the Hero Rules are in effect, his Knockout Roll due to the 11 PD injury is based only on the wounds received that Impulse, here 11 PD. Trent makes his Knockout Roll of 10 and drags Axly to cover.

Base Speed / 1A

STR	Encumbrance																	
	10	15	20	25	30	35	40	45	50	55	60	70	80	90	100	125	150	200
21	4.5	4.5	4	4	4	3.5	3.5	3.5	3.5	3.5	3	3	3	3	3	2.5	2.5	2
20	4.5	4	4	3.5	3.5	3.5	3.5	3.5	3	3	3	3	3	2.5	2.5	2.5	2.5	2
19	4	4	3.5	3.5	3	3	3	3	3	2.5	2.5	2.5	2.5	2.5	2	2	2	1.5
18	4	3.5	3.5	3	3	3	2.5	2.5	2.5	2.5	2.5	2	2	2	2	1.5	1.5	1.5
17	3.5	3	3	3	2.5	2.5	2.5	2.5	2	2	2	2	2	1.5	1.5	1.5	1.5	1
16	3.5	3	2.5	2.5	2.5	2.5	2	2	2	2	2	1.5	1.5	1.5	1.5	1	1	1
15	3	3	2.5	2.5	2	2	2	2	2	1.5	1.5	1.5	1.5	1.5	1	1	1	
14	3	2.5	2.5	2	2	2	2	1.5	1.5	1.5	1.5	1.5	1.5	1	1	1	1	
13	3	2.5	2.5	2	2	2	1.5	1.5	1.5	1.5	1.5	1.5	1	1	1	1		
12	3	2.5	2	2	2	2	1.5	1.5	1.5	1.5	1.5	1	1	1	1			
11	3	2.5	2	2	2	2	1.5	1.5	1.5	1.5	1.5	1	1	1	1			
10	3	2.5	2	2	2	2	1.5	1.5	1.5	1.5	1.5	1	1	1	1			
9	3	2.5	2	2	2	2	1.5	1.5	1.5	1.5	1.5	1	1	1	1			
8	3	2.5	2	2	2	1.5	1.5	1.5	1.5	1.5	1.5	1	1	1	1			
7	2.5	2.5	2	2	2	1.5	1.5	1.5	1.5	1.5	1.5	1	1	1	1			
6	2.5	2.5	2	2	2	1.5	1.5	1.5	1.5	1.5	1	1	1	1	1			
5	2.5	2.5	2	2	1.5	1.5	1.5	1.5	1.5	1	1	1	1	1				
4	2.5	2	2	1.5	1.5	1.5	1.5	1	1	1	1	1						
3	2.5	2	1.5	1.5	1.5	1	1	1	1	1	1							
2	2	1.5	1.5	1.5	1	1	1	1										
1	1.5	1.5	1															

Maximum Speed (MS) / 1B

AGI	Base Speed							
	1	1.5	2	2.5	3	3.5	4	4.5
21	2	4	5	7	9	10	12	13
20	2	4	5	7	8	10	11	13
19	2	4	5	7	8	10	11	12
18	2	4	5	6	8	9	11	12
17	2	3	5	6	8	9	10	12
16	2	3	5	6	8	9	10	11
15	2	3	5	6	7	9	10	11
14	2	3	4	6	7	8	9	11
13	2	3	4	6	7	8	9	10
12	2	3	4	5	7	8	9	10
11	2	3	4	5	6	7	8	9
10	2	3	4	5	6	7	8	9
9	2	3	4	5	6	7	8	9
8	2	3	4	4	5	6	7	8
7	2	3	3	4	5	6	7	8
6	2	2	3	4	5	5	6	7
5	1	2	3	4	4	5	6	6
4	1	2	3	3	4	4	5	6
3	1	2	2	3	3	4	4	5
2	1	1	2	2	3	3	4	4
1	1	1	1	2	2	2	3	3

Skill Accuracy

Skill Level	SAL
0	0
1	5
2	7
3	9
4	10
5	11
6	12
7	13
8	14
9	15
10	16
11	17
12	18
13	19
14	20
15	21
16	22
17	23
18	24
19	25
20	26

Combat Action Table / 1D

ISF = INT + SAL

MS	Intelligence Skill Factor (ISF)																	
	7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39	
1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	
2	1	1	1	2	2	2	2	2	2	3	3	3	3	3	3	4	4	
3	1	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6	
4	2	2	3	3	4	4	4	5	5	5	6	6	6	7	7	7	7	
5	2	3	3	4	4	5	5	6	6	7	7	7	8	8	8	9	9	
6	3	3	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11	
7	3	4	5	5	6	7	7	8	9	9	10	10	11	11	12	12	13	
8	3	4	5	6	7	8	9	9	10	11	11	12	12	13	14	14	15	
9	4	5	6	7	8	9	10	10	11	12	13	13	14	15	15	16	17	
10	4	6	7	8	9	10	11	12	12	13	14	15	16	16	17	18	18	
11	5	6	7	9	10	11	12	13	14	15	15	16	17	18	19	19	20	
12	5	7	8	10	11	12	13	14	15	16	17	18	19	20	21	21	22	
13	6	7	9	11	12	13	14	15	16	17	18	19	20	21	22	23	24	

Combat Actions Per Impulse / 1E

Combat Actions	Impulse			
	1	2	3	4
1	1			
2	1		1	
3	1		1	1
4	1	1	1	1
5	2	1	1	1
6	2	1	2	1
7	2	1	2	2
8	2	2	2	2
9	3	2	2	2
10	3	2	3	2
11	3	2	3	3
12	3	3	3	3
13	4	3	3	3
14	4	3	4	3
15	4	3	4	4
16	4	4	4	4
17	5	4	4	4
18	5	4	5	4
19	5	4	5	5
20	5	5	5	5
21	6	5	5	5

Odds of Hitting / 2A

Shot Accuracy	Target Range in Hexes 2	3	4	6	7	10	20	40	70	100	200	300
-30	00											
-28	01											
-26	02	01										
-24	03	01	01									
-22	05	02	01	00								
-20	07	04	02	01	01							
-18	12	06	04	02	01	00				MISS		
-16	18	09	06	03	02	01						
-14	27	15	09	05	04	02						
-12	39	22	15	07	06	03	01					
-11	46	27	18	09	07	04	01					
-10	53	33	22	12	09	05	01					
-9	60	39	27	15	12	06	02	00				
-8	67	46	33	18	15	07	02	01				
-7	74	53	39	22	18	09	03	01				
-6	80	60	46	27	22	12	04	01				
-5	86	67	53	33	27	15	05	02				
-4	90	74	60	39	33	18	06	02	00			
-3	94	80	67	46	39	22	07	03	01			
-2	96	86	74	53	46	27	09	04	01	00		
-1	98	90	80	60	53	33	12	05	01	01		
0		94	86	67	60	39	15	06	02	01		
1		96	90	74	67	46	18	07	02	01		
2		98	94	80	74	53	22	09	03	02		
3			96	86	80	60	27	12	04	02	00	
4			98	90	86	67	33	15	05	03	01	
5				94	90	74	39	18	06	04	01	
6				96	94	80	46	22	07	05	01	00
7				98	96	86	53	27	09	06	02	01
8					98	90	60	33	12	07	02	01
9						94	67	39	15	09	03	01
10						96	74	46	18	12	04	02
11						98	80	53	22	15	05	02
12							86	60	27	18	06	03
13							90	67	33	22	07	04
14							94	74	39	27	09	05
15							96	80	46	33	12	06
16							98	86	53	39	15	07
17								90	60	46	18	09
18			HIT					94	67	53	22	12
19								96	74	60	27	15
20								98	80	67	33	18
21									86	74	39	22
22									90	80	46	27
23									94	86	53	33
24									96	90	60	39
25									98	94	67	46
26										96	74	53
27										98	80	60
28											86	67
29											90	74
30											94	80
31											96	86
32											98	90
33												94
34												96

Automatic Fire Table / 2B
Multiple Hits

Target Range	Rate of Fire 4 - 8	9 - 15	16+
10	3	5	8
15	2	5	7
20	2	4	6
25	2	3	5
35	1	2	4
45	1	2	3
60	1	1	2
60+	1	1	1

Accuracy Modifiers / 2C

Shot Accuracy Modifier	Stance / Situation
	Shooter Stance
0	Standing
+3	Kneeling
+6	Prone
-6	Hip Firing*
-10	Shooter Moving or Ducking
-5	Target Moving, Ducking, or Appearing
	Target Size
-4	Looking Over Cover
0	Firing Over Cover
+8	Standing Exposed
+6	Kneeling Exposed
+2	Prone Exposed
	Firing Through Smoke
-4	With Ultrasonics
-14	Without Ultrasonics

Explosive Weapon Target Size Modifiers

+12	Target is a Hex
+9	Target is a Window
+13	Target is a Door

Automatic Fire - All Automatic Fire is executed with a bonus of 1 Action to the Aim Time.
Called Shots - The Shooter may choose to use the 'Firing Around Cover' Hit Location Table when firing at a target in the open. All such fire is executed with a 1 Action Aim Time penalty. This option is generally used for low Damage Class or low Penetration weapons, and increases the chance of disabling an opponent, at the cost of reduced accuracy.
* **-Hip Firing.** Establishing a Firing Stance takes 2 Actions, after which the Aim Time begins; if a Firing Stance is not established, the Hip Firing modifier is used.

Hit Location and Damage Table / 3A

WEAPON PENETRATION LINE	GLANCING ROLL (0 - 9)	
	LOW VELOCITY DAMAGE	OVER PENETRATING DAMAGE
4	0 - 2	3 - 9
3	3 - 9	
2	6 - 9	
1	9	

HIT LOCATION ROLL						Over Penetrating Physical Damage Weapon Damage Class (DC)			
Firing Around Cover	In The Open	Hit Location		Physical Damage		1 -2	3-5	6-8	9-10
00-02	00-00	**Head**	Glance	7	Light Wound	7	200	1,000	80,000
03-17	01-02		Forehead	2,000	Critical Wound	2,000	60,000	Dead	Dead
18-22	03-03		Eye-Nose	3,000	Critical Wound	3,000	80,000	Dead	Dead
23-38	04-05		Mouth	300	Critical Wound	300	6,000	30,000	Dead
39-56	06-08	**Arm**	Glance	1	Superficial Wound	1	*5	*11	*32
57-69	09-10		Shoulder	*21	Disabling Injury	*21	**500	**1,000	**1,000
70-76	11-11		Upper Arm - Flesh	3	Superficial Wound	3	*12	**100	**100
77-80	12-12		Upper Arm - Bone	*7	Disabling Injury	*7	*60	**100	**100
81-83	13-13		Forearm - Flesh	3	Superficial Wound	3	*12	*50	*50
84-92	14-14		Forearm - Bone	*6	Disabling Injury	*6	*60	**60	**60
93-95	15-15		Hand	3	Superficial Wound	3	*8	*15	*15
96-99	16-16		Weapon		Weapon Critical				
	17-19	**Body**	Glance	1	Superficial Wound	1	7	16	47
	20-23		Chest	51	Heavy Wound	51	100	300	2,000
	24-24		Base of Neck	300	Critical Wound	300	6,000	40,000	Dead
	25-25		Heart	4,000	Critical Wound	4,000	100,000	Dead	Dead
	26-30		Spine	300	Critical Wound	300	5,000	30,000	Dead
	31-42		Abdomen	35	Heavy Wound	35	900	5,000	30,000
	43-56		Pelvis	21	Medium Wound	21	100	500	4,000
	57-60	**Leg**	Glance	1	Superficial Wound	1	*7	*16	*47
	61-77		Thigh - Flesh	3	Superficial Wound	3	*88	**500	**600
	78-82		Thigh - Bone	*16	Disabling Injury	*16	**400	**700	**700
	83-99		Shin - Foot	*14	Disabling Injury	*14	**200	**200	**200

* - Indicates a Disabling Injury ** - Indicates a Disabling Injury to a combatant on Herculon or Anestalon (See Living Steel)

Penetration Summary / 3B

Armor Protection Factor PF	Weapon PEN Penetration Line 1	2	3	4
2	3	4	6	7
4	5	7	9	11
6	7	10	12	16
10	11	15	19	25
16	17	23	29	38
20	21	28	36	47
30	31	41	53	69
40	41	54	70	91
50	51	67	87	113
60	61	80	104	135
70	71	93	120	156
100	101	132	171	222
180	181	236	306	398
200	201	262	340	442

Weapon Summary / 3C

Weapon	Penetration (Ammo Type) FMJ	AP	Damage Class
Pistols			
9mm	2	3	3
45 ACP	2	2	3
SMG			
9mm	2	4	3
45 ACP	2	2	3
Rifles & MG			
M 16	17	23	6
M 14	20	28	8
AK 47	11	16	7
AK 74	14	19	6
M 60	20	28	8

Explosive Concussion Table / 3D

Explosive	Target Range from Burst C	0	1	2	3	5	10
Frag Grenade							
In Open	13k	700	180	50	30	12	4
Partial Cover	6h	350	90	25	15	6	2
Prone	10h	525	135	38	22	9	3
Blast Grenade							
In Open	20k	900	220	60	32	14	4
Partial Cover	10k	450	110	30	16	7	2
Prone	15k	675	165	45	24	10	3
40mm Grenade							
In Open	32h	273	80	25	13	6	1
Partial Cover	16h	136	40	12	6	3	1
Prone	24h	205	60	19	10	4	1

Range / 4A

Range	ALM
1	33
2	28
3	25
4	23
5	22
6	20
7	19
8	18
9	17
11	16
12	15
14	14
16	13
19	12
22	11
25	10
30	9
35	8
40	7
45	6
50	5
55	4
65	3
75	2
85	1
100	0
115	-1
130	-2
150	-3
170	-4
200	-5
230	-6
250	-7
300	-8
350	-9
400	-10
450	-11
500	-12
600	-13
700	-14
800	-15
950	-16
1100	-17
1250	-18
1400	-19
1650	-20
1900	-21
2150	-22
2500	-23
2850	-24
3300	-25
3800	-26
4350	-27

Situation & Stance Modifiers / 4B

ALM	
0	Standing (standing & braced +4)
+3	Kneeling (kneeling & braced +5)
+6	Prone (prone & braced +7)
+1	Using Sling for Support (Aim Time >7)
-6	Firing from the Hip
-7	Firing Rifle with One Hand
-4	Firing Pistol with One Hand
-4	Folding Stock Not Used
-3	Firing Pistol Double Action
-2	Deployed Bipod Not Braced
+3	Bipod Mounted Weapon
+5	Tripod Mounted Weapon
+11	Turret Mounted Weapon
+3	Pistol with Shoulder Stock

Visibility Modifiers / 4C

ALM	
0	Good Visibility
-2	Dusk
-4	Night Full Moon
-6	1/2 Moon
-12	No Moon
-10	Firing at Muzzle Flash
-6	Smoke, Haze, Fog
-8	Looking into a Light
-6	Optical Scope under 8 hexes
-4	Optical Scope Broken
-8	Advanced Aiming System Broken
-4	Weapon Sights Broken
-8	Firing from Teargas, No Mask
-14	Shooter Not Looking

Movement Modifiers / 4D

Speed HPI	Target Range in 2 Yard Hexes												
	10	20	40	70	100	200	300	400	600	800	1000	1200	1500
.5	-6	-5	-5										
1	-8	-6	-5	-5				-5					
2	-10	-8	-6	-5	-5			(No Maximum Aim)					
3		-10	-7	-6	-5	-5							
4			-8	-6	-6	-5	-5						
10			-10	-10	-8	-6	-5	-5	-5	-5			
20					-10	-8	-7	-6	-5	-5	-5	-5	
30						-10	-8	-7	-6	-6	-5	-5	-5
40							-9	-8	-7	-6	-5	-5	-5
50							-10	-9	-8	-7	-6	-6	-5
60				-10				-10	-8	--7	-6	-6	-6
70				(Maximum 2 Impulse Aim)					-9	-8	-7	-6	-6
80									-9	-8	-7	-7	-6
90									-10	-9	-8	-7	-6
100										-9	-8	-7	-7
110										-10	-9	-8	-7
120										-10	-9	-8	-7

Standard Target Size Modifiers / 4E

	Target Size	Auto Elev	Auto Width
Look Over/Around	-4	-3	-3
Fire Over/Around	0	+2	+2
Standing Exposed	+7	+14	+1
Kneeling Exposed	+6	+11	+3
Prone / Crawl	+2	+2	+2
Running	+8	+14	+1
Low Crouch	+7	+11	+2
Hands and Knees	+6	+8	+1
Low Prone	+1	0	+5
Head	-3	0	-3
Body	+5	+8	+3
Legs	+4	+8	0

Target Size Modifier Table / 4F

Size	ALM	Size	ALM	Size	ALM
.1	-15	1.6	+5	8.4	+17
.2	-10	1.8	+6	9.7	+18
.3	-7	2.1	+7	11.1	+19
.4	-5	2.4	+8	12.8	+20
.5	-3	2.7	+9	14.7	+21
.6	-2	3.2	+10	16.9	+22
.7	-1	3.6	+11	19.4	+23
.8	0	4.2	+12	22.3	+24
.9	+1	4.8	+13	25.7	+25
1.0	+2	5.5	+14	29.5	+26
1.2	+3	6.3	+15	34.0	+27
1.4	+4	7.3	+16	39.0	+28

Odds of Hitting / 4G

EAL	Single Shot	Burst Elev.
28	99	99
27	98	98
26	96	98
25	94	97
24	90	95
23	86	92
22	80	90
21	74	86
20	67	82
19	60	77
18	53	73
17	46	68
16	39	62
15	33	57
14	27	52
13	22	47
12	18	43
11	15	38
10	12	34
9	09	31
8	07	27
7	06	24
6	05	21
5	04	19
4	03	17
3	02	15
2	02	13
1	01	11
0	01	10
-1	01	09
-2	00	08
-3		07
-4		06
-5		05
-6		04
-8		03
-10		02
-15		01
-17		00
-22		

Grenade ALM / 4H

Hex TS ALM = +12

Throw Aim AC	Aim Time Mod
1	-26
2	-18
3	-14
4	-12
6	-11
8	-10

Automatic Fire and Shrapnel Hit Chance / 5A

Arc of Fire	Index	Rate Of Fire (ROF) 3	4	5	6	7	8	9	10	12	18	36	54	72	144	Pellet Hit Chance Shrapnel Hit Chance
	31	*3	*4	*5	*6	*7	*8	*9	*10	*12	*18	*36	*54	*72	*144	*58
	30	*3	*4	*5	*5	*6	*7	*8	*9	*11	*16	*33	*49	*65	*131	*44
	29	*2	*3	*4	*5	*6	*6	*7	*8	*9	*14	*28	*43	*57	*114	*33
.2	28	*2	*3	*3	*4	*5	*5	*6	*7	*8	*12	*25	*37	*50	*99	*25
	27	*2	*2	*3	*4	*4	*5	*5	*6	*7	*11	*22	*32	*43	*86	*19
	26	*2	*2	*3	*3	*4	*4	*5	*5	*6	*9	*19	*28	*37	*75	*14
.3	25	*1	*2	*2	*3	*3	*4	*4	*5	*5	*8	*16	*24	*33	*65	*11
	24	*1	*2	*2	*2	*3	*3	*4	*4	*5	*7	*14	*21	*28	*57	*8
.4	23	*1	*1	*2	*2	*2	*3	*3	*3	*4	*6	*12	*18	*25	*49	*6
	22	89	*1	*1	*2	*2	*2	*3	*3	*4	*5	*11	*16	*21	*43	*5
.5	21	77	*1	*1	*2	*2	*2	*2	*3	*3	*5	*9	*14	*19	*37	*4
.6	20	67	89	*1	*1	*2	*2	*2	*2	*3	*4	*8	*12	*16	*32	*3
.7	19	58	78	97	*1	*1	*2	*2	*2	*2	*4	*7	*11	*14	*28	*2
.8	18	51	67	84	*1	*1	*1	*2	*2	*2	*3	*6	*9	*12	*24	*2
.9	17	44	58	73	88	*1	*1	*1	*1	*2	*3	*5	*8	*11	*21	*1
1	16	38	51	64	77	89	*1	*1	*1	*2	*2	*5	*7	*9	*19	87
	15	33	44	55	66	78	89	*1	*1	*1	*2	*4	*6	*8	*16	65
	14	28	38	48	58	67	77	87	97	*1	*2	*3	*5	*7	*14	49
	13	25	33	41	50	58	67	75	84	*1	*2	*3	*5	*6	*12	37
	12	21	29	36	43	51	58	65	73	88	*1	*3	*4	*5	*11	28
2	11	18	25	31	38	44	50	57	63	76	*1	*2	*3	*5	*9	21
	10	16	21	27	33	38	44	49	55	66	*1	*2	*3	*4	*8	15
	9	14	18	23	28	33	38	43	48	57	86	*2	*3	*3	*7	11
3	8	12	16	20	24	29	33	37	41	50	75	*2	*2	*3	*6	8
	7	10	14	17	21	25	28	32	36	43	65	*1	*2	*3	*5	6
4	6	9	12	15	18	21	25	28	31	37	56	*1	*2	*2	*5	4
	5	7	10	13	16	18	21	24	27	32	49	98	*1	*2	*4	3
5	4	6	9	11	13	16	18	21	23	28	42	85	*1	*2	*3	2
6	3	5	7	10	12	14	16	18	20	24	37	74	*1	*2	*3	1
7	2	5	6	8	10	12	14	15	17	21	32	64	97	*1	*3	1
8	1	4	5	7	9	10	12	13	15	18	28	56	84	*1	*2	0
10	0	3	5	6	7	9	10	11	13	16	24	48	73	98	*2	0
11	-1	3	4	5	6	7	9	10	11	13	21	42	64	85	*2	
13	-2	2	3	4	5	6	7	8	9	12	18	36	55	74	*1	
15	-3	2	3	4	4	5	6	7	8	10	15	32	48	64	*1	
17	-4	1	2	3	4	5	5	6	7	8	13	27	41	56	*1	
20	-5	1	2	2	3	4	5	5	6	7	11	24	36	48	97	
23	-6	1	1	2	3	3	4	4	5	6	10	20	31	42	85	
26	-7	1	1	2	2	3	3	4	4	5	8	18	27	36	73	
30	-8	0	1	1	2	2	3	3	3	4	7	15	23	31	64	
35	-9	0	1	1	1	2	2	3	3	4	6	13	20	27	55	
40	-10	0	0	1	1	1	2	2	2	3	5	11	17	23	48	
46	-11	0	0	0	1	1	1	2	2	3	4	10	15	20	42	
53	-12	0	0	0	1	1	1	1	2	2	4	8	13	17	37	
61	-13	0	0	0	0	1	1	1	1	2	3	7	11	15	31	
70	-14	0	0	0	0	0	1	1	1	1	2	6	9	13	27	
81	-15		0	0	0	0	0	1	1	1	2	5	8	11	23	
93	-16		0	0	0	0	0	0	0	1	2	4	7	10	20	
107	-17		0	0	0	0	0	0	0	1	1	4	6	8	17	
123	-18			0	0	0	0	0	0	0	1	3	5	7	15	
142	-19				0	0	0	0	0	0	1	2	4	6	13	
163	-20				0	0	0	0	0	0	1	2	4	5	11	
188	-21					0	0	0	0	0	0	2	3	4	10	

Blast Modifiers / 5B

BM	Target
10	Underwater
5	In Small Room (10')
3	In Open Trench
1	In the Open
.75	Prone
.5	Under Partial Cover
.25	In Combat Suit
.01	In Power Armor
0	Behind Solid Cover

Shot Scatter / 5C

Difference in SA	Scatter (hexes)
1-7	1
8-11	2
12-13	3
14-15	4
16-17	5
18-19	6
20-21	8
22	10
23	12
24	14
25	16
26	19
27	21
28	25

Body Hit Locations / 5D

Roll	
00-03	Shoulder Glance
04-05	Shoulder Socket
*06-07	Shoulder
*08-13	Torso Glance
*14-17	Base of Neck
*18-19	Lung - Rib
*20-23	Lung
*24-25	Heart
*26-27	Liver - Rib
*28-29	Liver
*30-31	Stomach - Rib
*32-33	Stomch
*34-35	Stomach - Kidney
*36-37	Stomach - Spleen
*38-41	Liver - Kidney
*42-46	Liver - Spine
*47-54	Intestines
*55-60	Spine
61-82	Pelvis
83-99	Hip Socket

* Covered by Body Armor

Hit Location and Damage Table / 6A

Weapon Damage Class (DC), Effective Penetration (EPEN), and Physical Damage (PD)

H = 100 K = 1,000 T = 10,000 X = 100,000 M = 1,000,000

Fire	Open	Hit Location	DC = 1 EPEN							DC = 2 EPEN							DC = 3 EPEN							DC = 4 EPEN					
			.5	1	1.5	2	3	5	10	1	1.5	2	2.5	3	5	10	1	1.5	2	2.5	3	5	10	1	2	2.5	3	5	10
00-02	00-00	Head Glance	1	5	7	7	7	7	7	16	24	24	24	24	24	24	57	83	83	83	83	83	83	1H	2H	2H	2H	2H	2H
03-16	01-02	Forehead	11	1K	2K	2K	2K	2K	2K	4K	5K	6K	8K	8K	8K	8K	1T	2T	2T	3T	3T	3T	3T	3T	5T	6T	6T	6T	6T
17-21	03-03	Eye - Nose	4	1K	2K	3K	3K	3K	3K	4K	5K	1T	1T	1T	1T	1T	1T	2T	4T	4T	4T	4T	4T	3T	8T	8T	8T	8T	8T
22-32	04-05	Mouth	1	3	3	45	2H	2H	2H	11	12	2H	8H	8H	8H	8H	37	40	5H	3K	3K	3K	3K	77	1K	5T	6K	6K	6K
33-34	06-06	Neck Flesh	1	1	1	1	1	1	1	5	5	5	5	5	5	5	11	11	11	11	11	11	11	19	19	19	19	19	19
35-36	07-07	Neck Spine	3	4	5	2H	2H	2H	2H	15	17	7H	8H	8H	8H	8H	54	60	3K	3K	3K	3K	3K	1H	5K	6K	6K	6K	6K
37-48	08-08	Shoulder Glance	1	1	1	1	1	1	1	2	2	2	2	2	2	2	3	3	3	3	3	3	3	5	5	5	5	5	5
49-60	09-09	Shoulder	1	2	2	4	4	4	4	7	8	14	14	14	14	14	23	27	49	49	49	49	49	48	1H	1H	1H	1H	1H
61-65	10-10	Arm Glance	1	1	1	1	1	1	1	2	2	2	2	2	2	2	3	3	3	3	3	3	3	5	5	5	5	5	5
66-71	11-11	Arm Flesh	1	1	1	1	1	1	1	3	3	3	3	3	3	3	9	9	9	9	9	9	9	18	18	18	18	18	18
72-74	12-12	Arm Bone	1	1	1	1	1	7	7	1	2	3	4	5	23	23	5	7	9	13	16	81	81	10	20	28	34	1H	1H
75-78	13-13	Elbow	1	1	2	3	3	3	3	4	7	9	10	10	10	10	14	25	30	34	34	34	34	29	62	71	71	71	71
79-81	14-14	Forearm Flesh	1	1	1	1	1	1	1	2	2	2	2	2	2	2	6	6	6	6	6	6	6	12	12	12	12	12	12
82-87	15-15	Forearm Bone	1	1	1	1	6	6	6	1	1	2	4	20	20	20	4	6	8	15	60	60	60	8	17	38	60	60	60
88-93	16-16	Hand	1	1	1	1	1	1	1	1	1	1	1	1	1	1	4	4	4	4	4	4	4	8	8	8	8	8	8
94-99	17-17	Weapon Critical																											
	18-19	Torso Glance	1	1	1	1	1	1	1	3	3	3	3	3	3	3	5	5	5	5	5	5	5	7	7	7	7	7	7
	20-21	Base of Neck	1	3	6	7	2H	3H	3H	12	21	24	5H	8H	8H	9H	40	74	83	2K	3K	3K	3K	83	2H	3K	6K	6K	6K
	22-22	Lung - Rib	1	1	64	71	79	79	79	1	79	87	98	98	98	98	2	1H	1H	1H	1H	1H	1H	2	2H	2H	2H	2H	2H
	23-24	Lung	37	40	51	51	51	51	51	50	62	62	62	62	62	62	71	89	89	89	89	89	89	96	1H	1H	1H	1H	1H
	25-25	Heart	1	2K	3K	3K	4K	4K	4K	8K	1T	1T	1T	1T	1T	1T	3T	3T	3T	4T	5T	5T	5T	6T	7T	9T	1X	1X	1X
	26-26	Liver - Rib	1	6	31	42	49	49	49	21	1H	1H	2H	2H	2H	2H	75	4H	5H	6H	6H	6H	6H	2H	1K	1K	1K	1K	1K
	27-27	Liver	4	27	28	35	35	35	35	94	98	1H	1H	1H	1H	1H	3H	3H	4H	4H	4H	4H	4H	7H	9H	9H	9H	9H	9H
	28-28	Stomach - Rib	1	4	19	27	38	38	38	6	27	37	45	53	53	53	11	46	63	89	89	89	89	16	95	1H	1H	1H	1H
	29-29	Stomach	3	17	19	28	28	28	28	24	27	40	40	40	40	40	41	45	67	67	67	67	67	62	1H	1H	1H	1H	1H
	30-30	Stomach-Spleen	1	2	25	41	50	50	50	6	64	1H	1H	1H	1H	1H	19	2H	3H	4H	4H	4H	4H	37	6H	8H	8H	8H	8H
	31-31	Stomach-Kidney	2	47	49	58	58	58	58	1H	1H	2H	2H	2H	2H	2H	4H	4H	5H	5H	5H	5H	5H	7H	9H	9H	9H	9H	9H
	32-33	Liver - Kidney	4	44	45	53	53	53	53	2H	2H	2H	2H	2H	2H	2H	5H	6H	6H	6H	6H	6H	6H	1K	1K	1K	1K	1K	1K
	34-35	Liver - Spine	4	12	12	2H	3H	3H	3H	41	43	7H	9H	9H	1K	1K	1H	2H	2K	3K	3K	3K	3K	3H	5K	7K	7K	7K	7K
	36-39	Intestines	3	17	21	21	21	21	21	23	28	28	28	28	28	28	37	45	45	45	45	45	45	53	66	66	66	66	66
	40-42	Spine	1	3	3	2H	2H	3H	3H	11	12	6H	8H	8H	8H	8H	35	39	2K	3K	3K	3K	3K	71	4K	5K	5K	5K	5K
	43-56	Pelvis	3	10	11	19	21	21	21	18	19	32	35	35	35	35	37	40	67	73	73	73	73	63	1H	1H	1H	1H	1H
	57-61	Leg Glance	1	1	1	1	1	1	1	3	3	3	3	3	3	3	5	5	5	5	5	5	5	7	7	7	7	7	7
	62-75	Thigh Flesh	1	2	3	3	3	3	3	6	12	12	12	12	12	12	22	42	42	42	42	42	42	46	88	88	88	88	88
	76-79	Thigh Bone	1	1	1	1	1	5	16	3	3	4	4	5	16	57	10	10	14	15	18	55	2H	21	29	31	38	1H	4H
	80-83	Knee	1	1	2	2	3	4	4	3	7	9	10	12	13	13	12	25	30	35	41	47	47	24	62	73	86	97	97
	84-88	Shin Flesh	1	1	1	1	1	1	1	3	3	3	3	3	3	3	9	9	9	9	9	9	9	18	18	18	18	18	18
	89-93	Shin Bone	1	1	1	1	1	2	14	1	1	1	1	2	8	47	2	2	4	4	7	29	2H	4	9	9	14	60	2H
	94-99	Ankle - Foot	1	1	1	1	1	1	1	1	1	2	3	3	3	3	3	4	7	9	12	12	12	6	14	20	25	25	25

Key / 6B

Fire	Hit Location roll used for a target firing over or around Blocking Cover.
Open	Hit Location roll used for a target in the Open.
Looking	For a target Looking over or around Blocking Cover, use the Fire column and a 00 - 22 roll.
DC	Damage Class measures weapon wound potential. The greater the DC, the greater the lethality.
EPEN	Effective Penetration = Weapon PEN - target's armor PF. If EPEN is less than the armor PF, the effective DC = 1.

Disabling Injuries / 6C

The shaded portions of the table indicate Disabling Injuries.

The Physical Damage (PD) determines overall chance of survival. It does not, however, account for shock due to broken bones. This shock may incapacitate, but does not decrease survival odds. To account for broken bones, the following Shock Points (SP) are added to the PD of wounds in the shaded portions of the table when making the Knockout Roll. These Shock Points are **not** added to the PD Total.

	SP		SP
Neck	+400	Spine	+400
Shoulder	+10	Thigh	+80
Arm	+20	Knee - Shin	+50
Hand	+10	Ankle - Foot	+20

Hit Location and Damage Table / 6A

Weapon Damage Class (DC), Effective Penetration (EPEN), and Physical Damage (PD)

H = 100 K = 1,000 T = 10,000 X = 100,000 M = 1,000,000

Fire	Open	Hit Location	DC = 5 EPEN 1	2	3	5	10	DC = 6 EPEN 1	2	3	5	10	DC = 7 EPEN 1	2	3	5	10	DC = 8 EPEN 1	3	5	10	DC = 9 EPEN 1	3	5	10	DC = 10 EPEN 1	3	5	10
00-02	00-00	Head Glance	2H	3H	3H	3H	3H	3H	4H	4H	4H	4H	7H	1K	1K	1K	1K	1K	2K	2K	2K	3K	4K	4K	4K	6K	8K	8K	8K
03-16	01-02	Forehead	5T	8T	9T	9T	9T	7T	1X	1X	1X	1X	2X	3X	3X	3X	3X	3X	5X	6X	6X	5X	8X	1M	1M	7X	1M	1M	1M
17-21	03-03	Eye - Nose	5T	1X	1X	1X	1X	8T	2X	2X	2X	2X	2X	4X	4X	4X	4X	3X	8X	8X	8X	6X	1M	1M	1M	1M	2M	2M	2M
22-32	04-05	Mouth	1H	2K	9K	1T	1T	2H	3K	1T	1T	1T	4H	7K	3T	3T	3T	8H	1T	6T	6T	1K	2T	1X	1X	2K	4T	2X	2X
33-34	06-06	Neck Flesh	29	29	29	29	29	39	39	39	39	39	79	79	79	79	79	1H	1H	1H	1H	3H	3H	3H	3H	6H	6H	6H	6H
35-36	07-07	Neck Spine	2H	9K	1T	1T	1T	3H	1T	1T	1T	1T	7H	3T	3T	3T	3T	1K	5T	6T	6T	2K	1X	1X	1X	3K	2X	2X	2X
37-48	08-08	Shoulder Glance	6	6	6	6	6	7	7	7	7	7	11	11	11	11	11	15	15	15	15	22	22	22	22	32	32	32	32
49-60	09-09	Shoulder	80	2H	2H	2H	2H	1H	3H	3H	3H	3H	3H	6H	6H	6H	6H	4H	9H	9H	9H	8H	2K	2K	2K	2K	3K	3K	3K
61-65	10-10	Arm Glance	6	6	6	6	6	7	7	7	7	7	11	11	11	11	11	15	15	15	15	22	22	22	22	32	32	32	32
66-71	11-11	Arm Flesh	31	31	31	31	31	46	46	46	46	46	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H
72-74	12-12	Arm Bone	17	33	57	1H	1H	26	49	85	1H	1H	60	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H
75-78	13-13	Elbow	48	1H	1H	1H	1H	72	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H
79-81	14-14	Forearm Flesh	20	20	20	20	20	31	31	31	31	31	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50	50
82-87	15-15	Forearm Bone	13	29	60	60	60	20	43	60	60	60	47	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60
88-93	16-16	Hand	14	14	14	14	14	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
94-99	17-17	Weapon Critical																											
	18-19	Torso Glance	9	9	9	9	9	11	11	11	11	11	16	16	16	16	16	22	22	22	22	32	32	32	32	47	47	47	47
	20-21	Base of Neck	1H	3H	1T	1T	1T	2H	4H	2T	2T	2T	5H	1K	4T	4T	4T	9H	2K	6T	7T	2K	4K	1X	1X	4K	8K	3X	3X
	22-22	Lung - Rib	3	2H	2H	2H	2H	3	3H	3H	3H	3H	6	5H	5H	5H	5H	9	7H	8H	8H	17	1K	1K	1K	32	3K	3K	3K
	23-24	Lung	1H	2H	2H	2H	2H	2H	2H	2H	2H	2H	3H	3H	3H	3H	3H	4H	5H	5H	5H	7H	9H	9H	9H	1K	2K	2K	2K
	25-25	Heart	1X	1X	2X	2X	2X	2X	2X	3X	3X	3X	4X	4X	6X	6X	6X	6X	7X	1M	1M	1M	2M	2M	2M	3M	3M	5M	5M
	26-26	Liver - Rib	3H	2K	2K	2K	2K	4H	3K	3K	3K	3K	9H	6K	7K	7K	7K	2K	1T	1T	1T	3K	2T	3T	3T	6K	4T	5T	5T
	27-27	Liver	1K	1K	1K	1K	1K	2K	2K	2K	2K	2K	4K	5K	5K	5K	5K	7K	9K	9K	9K	1T	2T	2T	2T	3T	3T	3T	3T
	28-28	Stomach - Rib	22	1H	2H	2H	2H	29	2H	2H	2H	2H	56	3H	5H	5H	5H	90	5H	8H	8H	2H	1K	1K	1K	3H	2K	2K	2K
	29-29	Stomach	87	1H	1H	1H	1H	1H	2H	2H	2H	2H	2H	4H	4H	4H	4H	4H	6H	6H	6H	7H	1K	1K	1K	1K	2K	2K	2K
	30-30	Stomach-Spleen	60	1K	1K	1K	1K	88	2K	2K	2K	2K	2H	4K	4K	4K	4K	4H	6K	8K	8K	8H	1T	2T	2T	2K	3T	3T	3T
	31-31	Stomach-Kidney	1K	1K	1K	1K	1K	2K	2K	2K	2K	2K	4K	5K	5K	5K	5K	7K	9K	9K	9K	2T	2T	2T	2T	3T	4T	4T	4T
	32-33	Liver - Kidney	2K	2K	2K	2K	2K	3K	3K	3K	3K	3K	6K	8K	8K	8K	8K	1T	1T	1T	1T	3T	3T	3T	3T	5T	7T	7T	7T
	34-35	Liver - Spine	5H	9K	1T	1T	1T	7H	1T	2T	2T	2T	2K	3T	4T	4T	4T	3K	5T	7T	7T	7K	1X	2X	2X	1T	2X	3X	3X
	36-39	Intestines	73	89	89	89	89	95	1H	1H	1H	1H	2H	2H	2H	2H	2H	3H	3H	3H	3H	5H	7H	7H	7H	1K	1K	1K	1K
	40-42	Spine	1H	7K	9K	9K	9K	2H	1T	1T	1T	1T	4H	2T	3T	3T	3T	7H	4T	5T	5T	2K	9T	1X	1X	3K	2X	2X	2X
	43-56	Pelvis	94	2H	2H	2H	2H	1H	2H	3H	3H	3H	3H	5H	5H	5H	5H	5H	8H	9H	9H	1K	2K	2K	2K	2K	4K	4K	4K
	57-61	Leg Glance	9	9	9	9	9	11	11	11	11	11	16	16	16	16	16	22	22	22	22	32	32	32	32	47	47	47	47
	62-75	Thigh Flesh	78	1H	1H	1H	1H	1H	2H	2H	2H	2H	3H	5H	5H	5H	5H	5H	6H	6H	6H	6H	6H	6H	6H	6H	6H	6H	6H
	76-79	Thigh Bone	35	48	63	2H	7H	53	72	95	3H	7H	1H	2H	2H	7H	7H	2H	3H	4H	7H	5H	7H	7H	7H	7H	7H	7H	7H
	80-83	Knee	40	1H	1H	2H	2H	60	2H	2H	2H	2H	1H	2H	2H	2H	2H	2H	2H	2H	2H	2H	2H	2H	2H	2H	2H	2H	2H
	84-88	Shin Flesh	31	31	31	31	31	46	46	46	46	46	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H	1H
	89-93	Shin Bone	7	14	24	1H	2H	11	22	35	2H	2H	26	50	82	2H	2H	45	89	1H	2H	1H	2H	2H	2H	2H	2H	2H	2H
	94-99	Ankle - Foot	9	24	42	42	42	14	36	63	63	63	33	84	95	95	95	58	95	95	95	95	95	95	95	95	95	95	95

Effective Armor Protection Factor (EPF) / 6D

Armor PF	Glancing Roll (0 - 9) 0	1	2	3	4	5	6	7	8	9	Armor PF	Glancing Roll (0 - 9) 0	1	2	3	4	5	6	7	8	9
2	2	2	3	3	3	3	4	4	4	5	60	66	72	78	85	93	102	111	122	133	145
4	4	5	5	6	6	7	7	8	9	10	70	76	84	91	100	109	119	130	142	155	169
6	7	7	8	9	9	10	11	12	13	15	80	87	95	104	114	124	136	148	162	177	194
10	11	12	13	14	16	17	19	20	22	24	90	98	107	117	128	140	153	167	182	199	218
16	17	19	21	23	25	27	30	32	35	39	100	109	119	130	142	156	170	186	203	221	242
20	22	24	26	28	31	34	37	41	44	48	120	131	143	156	171	187	204	223	243	266	290
30	33	36	39	43	47	51	56	61	66	73	140	153	167	182	199	218	238	260	284	310	339
40	44	48	52	57	62	68	74	81	89	97	180	197	215	235	256	280	306	334	365	399	435
50	55	60	65	71	78	85	93	101	111	121	200	218	239	261	285	311	340	371	405	443	484

Movement Table / 7A

Base Movement Costs

1	Forward
3	Backward
4	Oblique
5	Sideways

Movement Modifiers

Stance

+0	Standing / Running
+1	Low Crouch
+2	Hands and Knees
+3	Belly Crawl

Stairs - Hills

+1	Across Slope, Downhill, On Stairs
+2	Uphill

Brush or Rubble

+1	Light
+2	Medium
+3	Dense

Injuries

+2	Disabling Injury above Waist
+12	Disabling Injury below Waist

Water

+1	Depth 1 foot
+2	Depth 2 feet
+4	Depth 3 feet
+10	Depth 4 feet

Miscellaneous

+5	Concertina Wire
+1	Dry Sand on Surface
+2	Icy Surface
+3	In Scuba Flippers
+2	In Snow Shoes

Action Time Table / 7B

Actions

2	Assume a Firing Stance - Over or Around Cover
1	Assume a Hip Firing Stance - Over or Around Cover
1	Look Over or Around Cover
1	Duck from a Firing Stance or from Looking
1	Brace a Weapon
1	60 - 120 Degree Facing Change
2	60 Degree Facing Change in Firing Stance
1	Go from Standing to Kneeling
2	Go from Standing to Prone
1	Go from Kneeling to Prone
2	Go from Prone to Kneeling
3	Go from Prone to Standing
2	Kick Open a Door
3	Open a Door
6	Open a Window with Two Hands
6	Break and Clear Glass from a Window
6	Climb through a Window
6	Get Out of a Trench or Foxhole

Reloading

1	Cock a Revolver or Pistol
4	Take a Bullet or Magazine from a Pouch
6	Replace a Bullet or Magazine into a Pouch
8	Link a Belt of Ammunition
4	Load a Round into a Magazine
7	Load a Charging Strip into a Magazine
4	Open a Hinged Type Ammunition Can
4	Open a Paper Box of Ammunition
RT	Unload a Weapon RT = weapon's Reload Time

Weapon Functions

1	Safety or Fire Select Switch
4	Pick Up or Set Down a Weapon
3	Grab an Unheld Slung Weapon (slung across front of chest)
	Draw a Pistol from: (+2 Action Counts for Concealed Holsters)
3	Shoulder Holster
3	Belt Holster
2	Police Holster
2	Old West Fast Draw Holster
1	Modern Fast Draw Holster
2	Throw a Small Object
2	Pick up a Grenade or Small Object

Equipment

In	Out	
16	7	Backpack with Quick Release
6	4	Bandolier or Belt
3	2	Bayonet or Knife from Scabbard
3	3	Bayonet to Weapon
5	8	Bipod
24	13	Body Armor (external vest type)
18	10	Climbing Harness
6	4	Folding Stock
12	5	Gas Mask
12	4	Optical Scope with Quick Release
20	8	Parachute with Quick Release
8	6	Pistol Shoulder Stock
9	9	Silencer
3	2	Slung Weapon over Shoulder
12	8	Tripod and Weapon

Cover Protection Factors (PF) / 7C

Doors

2	Automobile
4	Elevator
2	Exterior Wood
5	Heavy Wood Gate
.3	Interior Wood
6	Metal Fire

Walls

	Brick
370	6 inch
980	12 inch
4	Cinder Block
25	Earth Filled
460	Concrete Filled
	Wood Frame
.3	Interior Plaster
1	Exterior Stucco
22	Log Timber

Roofs and Floors

2	Asphalt - Shingle Roof
4	Tile - Slate Roof
1	House Floor
260	High Rise Floor

Miscellaneous

1	Common Furniture
	55 gallon Drum
8	Water Filled
85	Earth Filled
3200	Concrete Filled
18	Horse
20	Railroad Tie
30	Telephone Pole
	Woods (per 10 hexes)
1	Light
4	Medium
17	Heavy

	Thickness in Inches						
	.12	.25	.5	.75	1	2	4
Aluminum	1	4	9	16	24	64	170
Bullet Proof Glass	.5	1	3	6	8	22	58
Fiberglass	.4	1	3	5	7	18	181
Steel	6	16	42	75	110	300	780
Steel Armor Plate	11	30	79	140	210	550	1500
Titanium Armor Plate	5	13	35	62	93	250	650
Wood	.3	.5	1	1	2	4	7

	Thickness in Inches						
	6	8	10	12	16	24	36
Concrete	450	680	930	1200	1800	3200	5600
Earth (hand packed)	20	27	34	40	54	80	120
Earth (hard ground)	24	32	41	48	65	96	140
Rock	900	1300	1800	2400	3600	6400	11000
Sand (loose)	11	15	19	23	30	45	68
Water	1	2	2	2	3	5	7
Wood	11	15	18	22	29	44	66

Medical Aid and Recovery Table / 8A

Damage Total	Healing Time	No Aid		First Aid		Aid Station		Field Hospital		Trauma Center						
										Recovery Roll						
										Trauma Center Tech Level						
DT	HT	CTP	RR	CTP	RR	CTP	RR	CTP	RR	CTP	13	14	15	16	17	18
5	17	79h	94	25d	96	RR = 99										
10	25	75h	89	25d	92											
15	30	72h	85	25d	89											
20	35	68h	81	25d	86	25d	96	RR = 99								
25	38	65h	77	25d	82	25d	95									
30	41	62h	73	25d	79	25d	94									
35	43	59h	69	25d	76	25d	93	25d	97							
40	44	56h	66	25d	73	25d	92	25d	96							
45	46	53h	63	25d	70	25d	91	25d	96	RR = 99						
50	47	51h	60	25d	68	25d	90	25d	95							
60	48	46h	54	25d	63	25d	89	25d	94							
70	50	41h	49	25d	58	25d	87	25d	94							
80	51	37h	44	25d	54	25d	85	25d	92	25d	97					
90	52	34h	40	25d	50	25d	83	25d	91	25d	96					
100	53	31h	36	25d	46	25d	82	25d	90	25d	96	97				
200	61	11h	12	23d	21	25d	67	25d	82	25d	92	94	96			
300	65	4h	04	19d	10	25d	55	25d	74	25d	89	91	94	96		
400	68	93m	01	16d	04	25d	45	25d	67	25d	85	88	92	95	97	
500	70	35m	00	13d	02	25d	37	25d	61	25d	82	85	90	94	96	
600	72	13m	00	10d	01	25d	30	25d	55	25d	79	82	88	93	95	
700	73	6m	00	8d	00	25d	25	25d	50	25d	76	80	86	92	94	
800	75	5m	00	7d	00	25d	20	25d	45	25d	73	77	84	91	94	97
900	76	4m		6d	00	25d	16	25d	41	25d	70	75	82	90	93	96
1000	77	90p		5d		25d	13	25d	37	25d	67	73	80	89	92	96
2000	84	85p		15h		6d	02	25d	13	25d	45	53	64	79	85	92
3000	88	81p		2h		21h	00	5d	05	18d	30	38	52	70	79	89
4000	91	76p		22m		4h	00	18h	02	72h	20	28	41	62	73	85
5000	93	71p		6m		63m	00	5h	01	21h	13	20	33	55	67	82
6000	95	67p		4m		36m	00	3h	00	12h	09	15	27	49	62	79
7000	96	62p		87p		29m		2h	00	10h	06	11	21	43	57	76
8000	98	57p		75p		25m		2h	00	8h	04	08	17	39	53	73
9000	99	52p		67p		22m		2h		7h	03	06	14	34	49	70
12000	102	38p		57p		19m		95m		6h	01	03	07	21	39	62
16000	105	25p		44p		15m		75m		5h	00	01	03	13	28	53
20000	107	1p		30p		10m		50m		3h		00	01	09	20	45
40000	114	1p		15p		5m		25m		2h			00	01	04	20
60000	118	1p		10p		3m		17m		68m				00	01	09
80000	121	1p		8p		75p		13m		52m					00	04
100000	123	1p		6p		60p		10m		40m						02

Incapacitation Time Table / 8B

PD Total	Random Roll 0	1-2	3-5	6-7	8	9
0	1p	1p	2p	4p	6p	11p
50	4p	15p	29p	47p	73p	4m
100	25p	3m	5m	9m	14m	25m
200	3m	11m	21m	23m	53m	96m
300	10m	33m	63m	2h	3h	5h
450	25m	85m	3h	4h	7h	12h
600	50m	3h	5h	9h	14h	25h
750	2h	6h	11h	19h	29h	53h
1000	5h	17h	32h	53h	82h	6d

Key

CTP = Critical Time Period; the maximum length of time between the time of the injury and the Recovery Roll (RR).
DT = Damage Total. Total Physical Damage (PD) taken times 10, divided by the character's Health Characteristic (HLT).
HT = Healing Time in days.
RR = Recovery Roll; percent chance of surviving.
d = Days
h = Hours
m = Minutes
p = Phases (2 seconds)

Date	Tech Level
1831-1889	1st Aid
1890-1918	Aid Stn
1919-1945	Fld Hsp
1946-2000	13
2001-2030	14
2031-2060	15
2061-2120	16
2121-2250	17
2251-2345	18

STATUS SHEET (BASIC GAME)

Name:

Characteristics

Strength	STR
Intelligence	INT
Will	WIL
Health	HLT
Agility	AGI
Base Speed	
Maximum Speed	MS
Gun Combat Skill Level	
Skill Accuracy Level	SAL
INT Skill Factor	ISF
Combat Actions	CA

Combat Actions per Impulse

	Impulse			
	1	2	3	4
Actions				

Knockout Value KV

Body Armor **Protection Factor** **Weight**

Helm:

Visor:

Body:

Limbs:

Equipment

Encumbrance =

Physical Status

PD Total:

Disabling Injuries:

Ammunition

Weapon Data:		**Aim Time**	**Aim Time Mod**	**Shot Accuracy**
Reload Time	RT	1		
Rate of Fire	ROF	2		
		3		
Ammunition Capacity	Cap	4		
Ammunition Weight	AW	5		
		6		
Penetration	PEN	8		
Damage Class	DC	10		
		12		

Knockout Table

PD Total	**Odds**
Under KV /10	00
Over KV / 10	10
Over KV	25
Over 2 X KV	75
Over 3 X KV	98

ACTION TIME TABLE

CA	**Action**
1	Running Stance: Move Forward 1 Hex
3	Move Backward 1 Hex
2	Low Crouch: Move Forward 1 Hex
4	Move Backward 1 Hex
3	Hand and Knees: Move Forward 1 Hex
5	Move Backward 1 Hex
+1	Moving on Stairs or Down / Across Hill
+2	Moving Uphill or Through Rubble
+4	Moving Through 3 Feet of Water

CA	**Action**
0	Change Facing 1 Hexside While Moving, per Hex
1	Change Facing by 1 or 2 Hexsides While Immobile
2	Assume a Firing Stance
1	Look Over / Around Cover
2	Throw a Grenade
3	Open a Door
6	Open a Window (2 Hands)

CA	**Action**
8	Reload a Weapon
4	Load a Magazine, per Round
4	Pick Up or Set Down a Weapon
8	Deploy Bipod for Weapon
6	Climb Through a Window
3	Draw Pistol - Shoulder Holster
2	Draw Pistol - Hip Holster
2	Draw a Hand-to-Hand Weapon
7	Get out of Military Backpack

STATUS SHEET (ADVANCED GAME)

Name:

Characteristics

Strength	STR
Intelligence	INT
Will	WIL
Health	HLT
Agility	AGI
Base Speed	
Maximum Speed	MS
Gun Combat Skill	
Skill Accuracy Level	SAL
INT Skill Factor	ISF
Combat Actions	CA

Combat Actions per Impulse

	Impulse			
	1	2	3	4
Actions				

Knockout Value KV

Body Armor **Protection Factor** **Weight**

Helm:

Visor:

Body:

Limbs:

Equipment

Encumbrance =

Physical Status

PD Total:

Disabling Injuries:

Ammunition:

Knockout Table

PD Total	Odds
Under KV / 10	00
Over KV / 10	10
Over KV	25
Over 2 X KV	75
Over 3 X KV	98

Weapon	Physical Data	Aim Time AC	Aim Time Mod	Shot Accuracy	Ballistic Data — Target Range in 2 yard hexes: 10 20 40 70 100 200 300 400
	L	1			FMJ PEN
	W	2			DC
		3			
	RT	4			JHP PEN
	ROF	5			DC
		6			
	Cap	7			AP PEN
	AW	8			DC
		10			
	KD	12			MA
	SAB				

ACTION TIME TABLE

CA	Action	
1	Running Stance:	Move Forward 1 Hex
3		Move Backward 1 Hex
2	Low Crouch:	Move Forward 1 Hex
4		Move Backward 1 Hex
+1	Moving on Stairs, or Down / Across Hill	
+2	Moving Uphill or Through Rubble	

CA	Action
0	Change Facing 1 Hexside While Moving, per Hex
1	Change Facing by 1 or 2 Hexsides While Immobile
2	Assume a Firing Stance
1	Look Over / Around Cover

CA	Actions
2	Throw a Grenade
3	Open a Door
4	Pick Up Weapon
4	Set Down Weapon
2	Draw Hand Weapon
7	Get out of Backpack

Phoenix Command

SMALL ARMS COMBAT SYSTEM

FN Mk 1

Browning High-Power pistol. Manufactured & sold worldwide.

Type 51

Chinese copy of the Soviet TI33. Standard pistol of the Chinese army.

Uzi

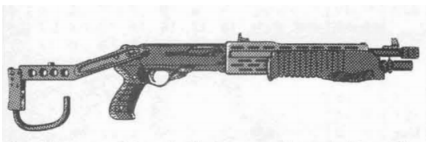
Sturdy, reliable weapon popular with police and secret service.

AKM 47

New model AK 47. The most widely exported communist weapon.

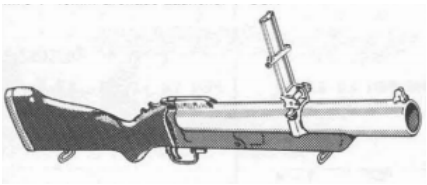
Franchi SPAS 12

Special Purpose Automatic Shotgun for police and military. The APS entry is for a special Armor Piercing Slug.



M79

Accurate breech loading grenade launcher which has been replaced by the M203.



Phoenix Command

SMALL ARMS COMBAT SYSTEM

M16A2

Late version of the M16A1 with three round burst capability.

HK 53

Short version of the HK 33 which can be used as n SMG or rifle.

M60

Adopted in the 1950s, this is the standard GPMG of US forces.

MAB PA15

Modern, high capacity pistol. Standard pistol of the French army.

Walther PPK

Small, easily concealed pistol designed for police undercover use.

Walther P1

Current version of the WW II P38. Standard pistol of the West German army.

Phoenix Command

SMALL ARMS COMBAT SYSTEM

HK P7M13

Modern pistol of innovative design used by the West German army and police.

PA3-DM

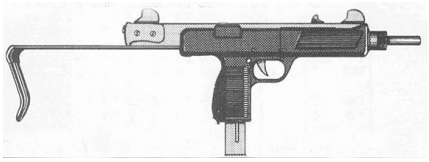
Standard Sub-Machinegun of the Argentine military.

F1

Australian Sub-Machinegun unusual for its top loading magazine.

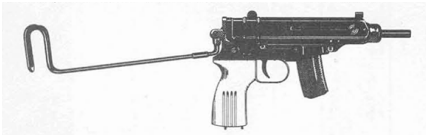
Steyr MPi 81

Steyr SMG used by the police & military.



M61 Skorpion

The Skorpion SMP is intended for vehicular crews and heavily loaded infantry.



MAT 49

Well made weapon used by the French army.

Phoenix Command

SMALL ARMS COMBAT SYSTEM

HK MP5

Widely exported SMG used by W German police & border guards.

L1A1-F1

Standard Australian army rifle patterned after the FN FAL. It is being replaced by the Austrian Steyr AUG.

Steyr AUG

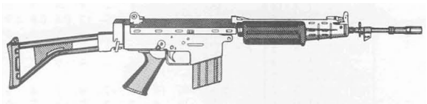
New Austrian rifle with an optical scope in its carrying handle.

FN FAL

Highly successful weapon exported to over 90 countries including the United Kingdom and Israel.

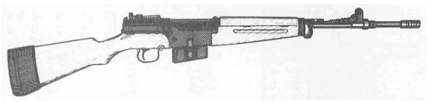
FN FNC

Modern successor to the FN CAL. This weapon has three round burst capability and like the FN FAL has been marketed for export



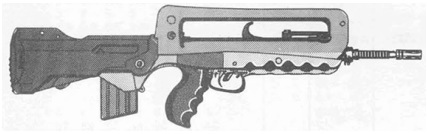
M1949-56

This French army rifle is still in service and is being replaced by the FAMAS. The FA MAS is currently only available to elite troops.



FA MAS

New French army rifle of lightweight, bullpup design.

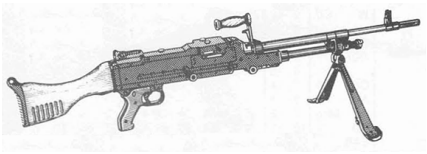


Phoenix Command

SMALL ARMS COMBAT SYSTEM

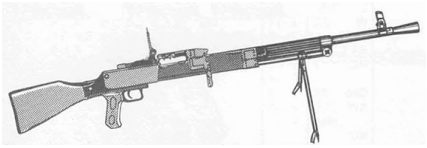
FN MAG

Reliable weapon considered one of the best GPMGs made.



Type 67

Chinese designed machine gun adopted in the early 1970s.



AA 762

Standard MG of the French army. AA 52 converted to 7.62mm NATO.

HK 13E

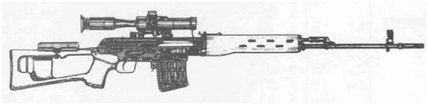
Squad Automatic Weapon version of the HK 13 LMG.

HK 11E

Squad Automatic Weapon variant of the HK 11A1 LMG.

Dragunov SVD

The Dragunov is equipped with a PSO-1 4x optical sight whose reticle is illuminated by a small battery. The scope is capable of detecting an infra-red source.



M1911A1

The Colt 45 Automatic Pistol has been the USA's standard military sidearm since WW I.

Phoenix Command

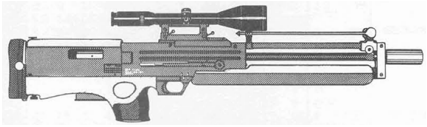
SMALL ARMS COMBAT SYSTEM

AKR

SMG version of the AKS 74 rifle. In service with Soviet forces.

Walther 2000

Specially designed sniper rifle with optical scope and biped.

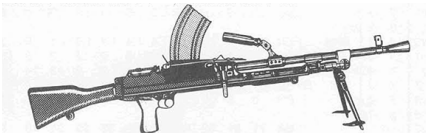


Beretta SC 70

Folding stock version of the Beretta AR 70 rifle. This weapon is replacing the BM 59 and is in service with the Italian Special Forces.

Bren L4

L4 series Bren gun in 7.62mm NATO. Used by all British forces.



Spectre

New SMG firing from a closed bolt using a four column magazine.

LAW 80

One shot disposable short range anti-tank weapon which uses a built-in low velocity 9mm spotting rifle. The spotting rifle has a 5 round capacity. The bullets have a tracer and flash warhead for recording a hit on target, thus determining its range.

M1 Garand

The M1 Garand was the first self-loading weapon accepted for military service. It entered service in 1936 and by 1941 was the standard US infantryman's weapon. The M1 Garand automatically ejects its ammo clip and single rounds cannot be fed to top off the clip.

Phoenix Command

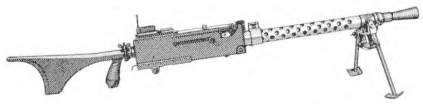
SMALL ARMS COMBAT SYSTEM

M9A1 Bazooka

The Bazooka fired a 60mm fin stabilized rocket with a hollnw charge explosive. The rocket was loaded by an assistant into the rear of the launch tube and connected to an electric firing wire. When the trigger was pressed, two batteries in the pistol grip electrically fired the rocket motor. The bazooka was one of the most effective infantry anti-tank weapons of the war. After the war, a 3.5 inch Super-Bazooka saw service in Korea.

M1919 A6

Developed in 1943, the M1919 A6 is a modified M1919 A4. A shoulder stock and bipod were added.

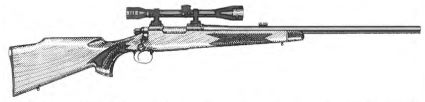


AR-15

Lightweight sporting rifle based on the M16 assault rifle.

Remington M700

The 308 Winchester was developed in 1952 and adopted by the US military in 1954 as the 7.62 mm NATO. It was designed to replace the 30'06, and since acceptance has proven to be an extremely accurate round. Today most world class shooting records are held by this cartridge. In part this is due to the thousands of rounds fired in matches each year, but the inherent accuracy of the cartridge cannot be disputed.



M26A2

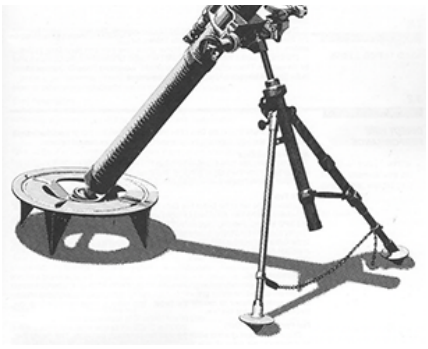
The M26A2 was a primary fragmentation grenade used by American forces in the Vietnam War.

M29A1

The M29A1 was a common 81mm used as fire base support in Vietnam and is almost identical to the M1 used in WWII. Crew of 5, reposition time of 30 phases and deploy time of 80 phases. Minimum range of 500 hexes. Uses a forward observer for

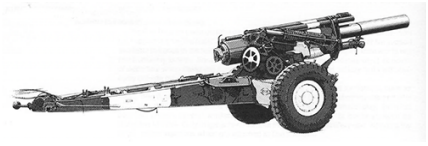
Phoenix Command

SMALL ARMS COMBAT SYSTEM



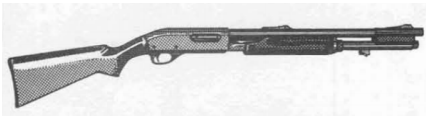
M114

The M114 155 mm Howitzer was developed shortly after WWII. Crew of 11, reposition time of 50 phases and deploy time of 65 phases. Maximum range of 7980 hexes. Uses a forward observer for accuracy.



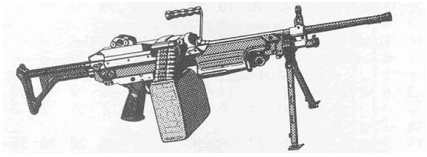
Remington M870

US Marine Corps version of the Remington Model 870. It was adopted in 1966 and has a standard M7 bayonet mounting lug.



M249

Belgium designed Squad Automatic Weapon adopted by the US army.



Colt Revolving Rifle

The Colt Revolving Rifle was introduced shortly before the American Civil War. It made use of a standard revolver action and was used for a short time by Berdan's sharpshooters before before the Sharp's rifles became available.

Colt Model 1851 Navy

The revolver was used by both army and navy personnel, and saw service with both Union and Confederate forces.

M2HB

Standard US Heavy Machine Gun in service since 1933.

Phoenix Command

SMALL ARMS COMBAT SYSTEM

Thompson M1928A1

First model of the Thompson sub-machinegun with drum magazine.

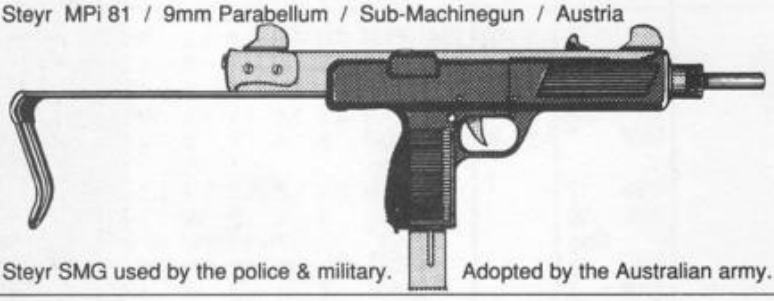
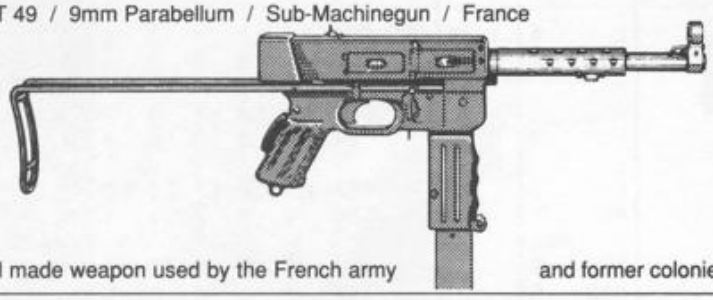
Automatic Pistols		Physical Data	Aim Time AC Md	Ballistic Data	Range in 2 yard hexes 10 20 40 70 100 200 300 400
FN Mk 1 Automatic Pistol 9mm Parabellum Belgium Browning High-Power pistol. Manufactured & sold world-wide.		L 8 W 2.3 RT 4 ROF * Cap 13 AW .50 Mag KD 3 SAB 4	1 -17 2 -11 3 -10 4 -9 5 -8 6 -7	FMJ PEN 2.1 1.9 1.6 1.3 1.0 .4 .2 .1 DC 3 3 2 2 1 1 1 1 JHP PEN 2.0 1.8 1.6 1.2 1.0 .4 .2 .1 DC 4 4 3 2 2 1 1 1 AP PEN 2.9 2.7 2.3 1.8 1.4 .6 .3 .1 DC 3 3 2 2 1 1 1 1 BA 46 38 29 22 17 8 2 -1 TOF 1 1 2 4 6 15 24 35
Type 51 Automatic Pistol 7.62 x 25mm China Chinese copy of the Soviet TT33. Standard pistol of the Chinese army.		L 8 W 1.9 RT 4 ROF * Cap 8 AW .33 Mag KD 3 SAB 4	1 -16 2 -11 3 -10 4 -9 5 -8 6 -7	FMJ PEN 2.7 2.5 2.2 1.7 1.3 .6 .3 .1 DC 3 3 2 2 2 1 1 1 JHP PEN 2.6 2.4 2.1 1.6 1.3 .6 .3 .1 DC 5 4 4 3 2 1 1 1 AP PEN 3.8 3.6 3.0 2.4 1.9 .9 .4 .2 DC 3 3 2 2 2 1 1 1 BA 48 40 31 24 19 10 5 1 TOF 0 1 2 3 5 12 20 29
MAB PA15 Automatic Pistol 9mm Parabellum France Modern, high capacity pistol. Standard pistol of the French army.		L 8 W 2.8 RT 4 ROF * Cap 15 AW .60 Mag KD 3 SAB 4	1 -18 2 -11 3 -10 4 -9 5 -8 6 -7	FMJ PEN 2.1 1.9 1.6 1.3 1.0 .4 .2 .1 DC 3 3 2 2 1 1 1 1 JHP PEN 2.0 1.8 1.6 1.2 1.0 .4 .2 .1 DC 4 4 3 2 2 1 1 1 AP PEN 2.9 2.7 2.3 1.8 1.4 .6 .3 .1 DC 3 3 2 2 1 1 1 1 BA 46 38 29 22 17 8 2 -1 TOF 1 1 2 4 6 15 24 35
Walther PPK Automatic Pistol 32 ACP W Germany Small, easily concealed pistol designed for police undercover use.		L 6 W 1.4 RT 4 ROF * Cap 7 AW .31 Mag KD 2 SAB 2	1 -16 2 -11 3 -10 4 -9 5 -8	FMJ PEN 1.0 .9 .7 .5 .3 .1 DC 1 1 1 1 1 1 JHP PEN .9 .8 .7 .5 .3 .1 DC 2 1 1 1 1 1 AP PEN 1.4 1.2 1.0 .7 .5 .2 DC 1 1 1 1 1 1 BA 44 36 27 19 14 5 TOF 1 1 3 5 8 20
Walther P1 Automatic Pistol 9mm Parabellum W Germany Current version of the WW II P38. Standard pistol of the West German army.		L 9 W 2.1 RT 5 ROF * Cap 8 AW .41 Mag KD 3 SAB 4	1 -17 2 -11 3 -10 4 -9 5 -8 6 -7	FMJ PEN 1.9 1.8 1.5 1.1 .9 .4 .1 .1 DC 3 3 2 2 1 1 1 1 JHP PEN 1.9 1.7 1.4 1.1 .8 .3 .1 .1 DC 4 4 3 2 1 1 1 1 AP PEN 2.7 2.5 2.1 1.6 1.2 .5 .2 .1 DC 3 2 2 2 1 1 1 1 BA 45 37 28 21 16 6 1 -2 TOF 1 1 2 4 6 15 25 36
HK P7M13 Automatic Pistol 9mm Parabellum W Germany Modern pistol of innovative design used by the West German army and police.		L 7 W 2.5 RT 3 ROF * Cap 13 AW .63 Mag KD 3 SAB 4	1 -17 2 -11 3 -10 4 -9 5 -8 6 -7	FMJ PEN 1.9 1.8 1.5 1.1 .9 .4 .1 .1 DC 3 3 2 2 1 1 1 1 JHP PEN 1.9 1.7 1.4 1.1 .8 .3 .1 .1 DC 4 4 3 2 1 1 1 1 AP PEN 2.7 2.5 2.1 1.6 1.2 .5 .2 .1 DC 3 2 2 2 1 1 1 1 BA 45 37 28 21 16 6 1 -2 TOF 1 1 2 4 6 15 25 36

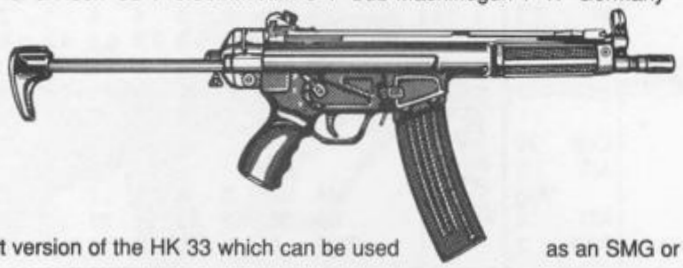
Automatic Pistols / Tech Level 13

Automatic Pistols		Physical Data	Aim Time AC Md	Ballistic Data	Range in 2 yard hexes 10 20 40 70 100 200 300 400
HK VP70M Automatic Pistol 9mm Parabellum W Germany Late model pistol with three round burst capability when its shoulder stock is attached.		L 8/21 W 2.5 RT 5 ROF ** Cap 18 AW .69 Mag KD 3 SAB 4	1 -17 2 -11 3 -10 4 -9 5 -8 6 -7	FMJ PEN 2.0 1.9 1.6 1.2 .9 .4 .2 .1 DC 3 3 2 2 1 1 1 1 JHP PEN 2.0 1.8 1.5 1.2 .9 .4 .2 .1 DC 4 4 3 2 2 1 1 1 AP PEN 2.9 2.6 2.2 1.7 1.3 .5 .2 .1 DC 3 3 2 2 1 1 1 1 3RB -10 -5 0 4 7 12 15 17 BA 45 37 28 21 16 6 1 -2 TOF 1 1 2 4 6 14 24 35
M1951 Automatic Pistol 9mm Parabellum Italy This Beretta pistol is used by the Italian & Israeli armies. It is also popular in the civilian market.		L 8 W 1.9 RT 5 ROF * Cap 8 AW .40 Mag KD 3 SAB 4	1 -16 2 -11 3 -10 4 -9 5 -8 6 -7	FMJ PEN 1.9 1.8 1.5 1.1 .9 .4 .1 .1 DC 3 3 2 2 1 1 1 1 JHP PEN 1.9 1.7 1.4 1.1 .8 .3 .1 .1 DC 4 4 3 2 1 1 1 1 AP PEN 2.7 2.5 2.1 1.6 1.2 .5 .2 .1 DC 3 2 2 2 1 1 1 1 BA 45 37 28 21 16 6 1 -2 TOF 1 1 2 4 6 15 25 36
M93R Automatic Pistol 9mm Parabellum Italy Beretta with three round burst capability. Issued to the Italian Special Forces.		L 9 W 3.1 RT 4 ROF ** Cap 20 AW .69 Mag KD 3 SAB 4	1 -18 2 -11 3 -10 4 -9 5 -8 6 -7	FMJ PEN 2.2 2.0 1.7 1.3 1.0 .4 .2 .1 DC 3 3 2 2 1 1 1 1 JHP PEN 2.1 2.0 1.6 1.3 1.0 .4 .2 .1 DC 5 4 4 3 2 1 1 1 AP PEN 3.1 2.9 2.4 1.9 1.4 .6 .3 .1 DC 3 3 2 2 1 1 1 1 3RB -2 3 8 12 15 20 22 24 BA 46 37 28 21 16 6 1 -2 TOF 0 1 2 4 6 14 23 33
M951R Machine Pistol 9mm Parabellum Italy Modified large capacity M1951 with fully automatic fire capability.		L 7 W 3.2 RT 4 ROF *6 Cap 10 AW .44 Mag KD 3 SAB 4	1 -18 2 -12 3 -10 4 -9 5 -8 6 -7	FMJ PEN 2.4 2.2 1.9 1.5 1.1 .5 .2 .1 DC 3 3 3 2 2 1 1 1 JHP PEN 2.3 2.1 1.8 1.4 1.1 .5 .2 .1 DC 5 5 4 3 2 1 1 1 AP PEN 3.4 3.1 2.6 2.0 1.6 .7 .3 .1 DC 3 3 3 2 2 1 1 1 MA .4 1 2 3 4 8 12 16 BA 46 37 28 21 16 7 1 -2 TOF 0 1 2 4 6 13 22 32
SIG P226 Automatic Pistol 9mm Parabellum Switzerland Well balanced, large capacity version of the SIG P220 with ambidextrous magazine catch.		L 8 W 2.2 RT 4 ROF * Cap 15 AW .55 Mag KD 3 SAB 4	1 -17 2 -11 3 -10 4 -9 5 -8 6 -7	FMJ PEN 1.9 1.8 1.5 1.1 .9 .4 .1 .1 DC 3 3 2 2 1 1 1 1 JHP PEN 1.9 1.7 1.4 1.1 .8 .3 .1 .1 DC 4 4 3 2 1 1 1 1 AP PEN 2.7 2.5 2.1 1.6 1.2 .5 .2 .1 DC 3 2 2 2 1 1 1 1 BA 45 37 28 21 16 6 1 -2 TOF 1 1 2 4 6 15 25 36
Makarov PM Automatic Pistol 9 x 18mm USSR Dating back to the 1950s, this is still the standard pistol of the Soviet military.		L 6 W 1.7 RT 5 ROF * Cap 8 AW .4 Mag KD 2 SAB 3	1 -16 2 -11 3 -10 4 -9 5 -8	FMJ PEN 1.2 1.1 .9 .6 .4 .1 DC 2 2 1 1 1 1 JHP PEN 1.2 1.0 .8 .6 .4 .1 DC 3 3 2 1 1 1 AP PEN 1.7 1.5 1.2 .8 .6 .2 DC 2 2 1 1 1 1 BA 41 32 23 15 10 1 TOF 1 1 3 5 7 18

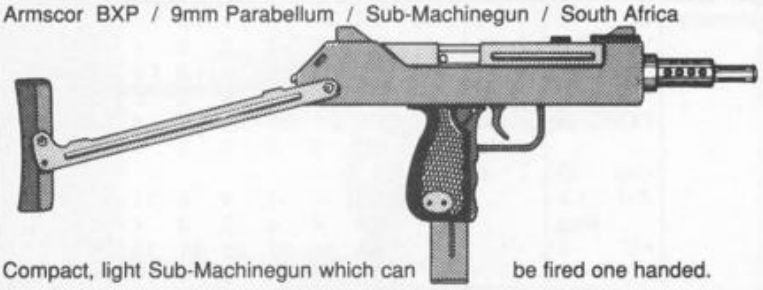
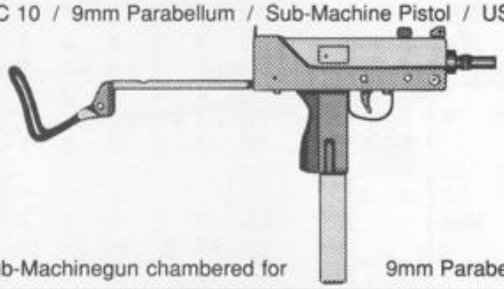
Automatic Pistols		Physical Data	Aim Time AC Md	Ballistic Data	Range in 2 yard hexes 10	20	40	70	100	200	300	400
5.45 PSM Automatic Pistol 5.45 x 18mm USSR Soviet pistol issued to internal security forces. It has an underpowered cartridge.		L 6 W 1.1 RT 5 ROF * Cap 8 AW .25 Mag KD 1 SAB 2	1 -15 2 -11 3 -10 4 -9 5 -8	FMJ PEN 1.2 1.1 .9 .7 .5 DC 1 1 1 1 1 JHP PEN 1.2 1.0 .9 .6 .5 DC 2 1 1 1 1 AP PEN 1.7 1.5 1.3 .9 .7 DC 1 1 1 1 1 BA 48 41 33 26 21 TOF 1 1 3 5 7							
M92F Automatic Pistol 9mm Parabellum USA Beretta 9mm which has become extremely popular since its successes in U.S. military trials.		L 9 W 2.4 RT 4 ROF * Cap 15 AW .60 Mag KD 3 SAB 4	1 -17 2 -11 3 -10 4 -9 5 -8 6 -7	FMJ PEN 2.4 2.2 1.9 1.5 1.1 DC 3 3 3 2 2 JHP PEN 2.3 2.1 1.8 1.4 1.1 DC 5 5 4 3 2 AP PEN 3.4 3.1 2.6 2.0 1.6 DC 3 3 3 2 2 BA 46 37 28 21 16 TOF 0 1 2 4 6	.5 1 .5 1 .7 1 7 13	.2 1 .2 1 .3 1 1 22	.1 1 .1 1 .1 1 -2 32
S&W M469 Automatic Pistol 9mm Parabellum USA Shortened version of the Smith and Wesson M459 designed for the US Air Force.		L 7 W 1.9 RT 4 ROF * Cap 12 AW .50 Mag KD 3 SAB 4	1 -16 2 -11 3 -10 4 -9 5 -8	FMJ PEN 2.0 1.9 1.6 1.2 .9 DC 3 3 2 2 1 JHP PEN 2.0 1.8 1.5 1.2 .9 DC 4 4 3 2 2 AP PEN 2.9 2.6 2.2 1.7 1.3 DC 3 3 2 2 1 BA 45 37 28 21 16 TOF 1 1 2 4 6	.4 1 .4 1 .5 1 6 14	.2 1 .2 1 .2 1 1 24	.1 1 .1 1 .1 1 -2 35
M1911A1 Automatic Pistol 45 ACP USA The Colt 45 Automatic Pistol has been the USA's standard military sidearm since WW I.		L 9 W 3.0 RT 4 ROF * Cap 7 AW .70 Mag KD 5 SAB 5	1 -18 2 -11 3 -10 4 -9 5 -8 6 -7	FMJ PEN 1.6 1.5 1.2 1.0 .8 DC 3 3 2 1 1 JHP PEN 1.5 1.4 1.2 .9 .7 DC 4 4 3 2 1 AP PEN 2.2 2.1 1.8 1.4 1.1 DC 3 3 2 1 1 BA 45 36 27 20 15 TOF 1 2 3 5 8	.3 1 .3 1 .5 1 5 19	.2 1 .1 1 .2 1 0 31	.1 1 .1 1 .1 1 -4 45
M15 Automatic Pistol 45 ACP USA The M15 General Officers Pistol is a shortened version of the M1911A1.		L 8 W 2.8 RT 4 ROF * Cap 7 AW .70 Mag KD 5 SAB 5	1 -18 2 -11 3 -10 4 -9 5 -8 6 -7	FMJ PEN 1.5 1.4 1.1 .9 .8 DC 3 3 2 1 1 JHP PEN 1.4 1.3 1.1 .8 .7 DC 4 3 3 2 1 AP PEN 2.1 2.0 1.7 1.3 1.0 DC 3 3 2 1 1 BA 45 37 27 20 15 TOF 1 2 3 5 8	.3 1 .3 1 .5 1 5 20	.2 1 .1 1 .2 1 0 32	.1 1 .1 1 .1 1 -4 47
ASP 9mm Automatic Pistol 9mm Parabellum USA Modified Smith & Wesson M39 with Guttersnipe sights intended for high level security.		L 7 W 1.4 RT 4 ROF * Cap 7 AW .40 Mag KD 3 SAB 4	1 -16 2 -12 3 -10	FMJ PEN 1.9 1.8 1.5 1.1 .9 DC 3 3 2 2 1 JHP PEN 1.9 1.7 1.4 1.1 .8 DC 4 4 3 2 1 AP PEN 2.7 2.5 2.1 1.6 1.2 DC 3 2 2 2 1 BA 45 37 28 21 16 TOF 1 1 2 4 6	.4 1 .3 1 .5 1 6 15	.1 1 .1 1 .2 1 1 25	.1 1 .1 1 .1 1 -2 36

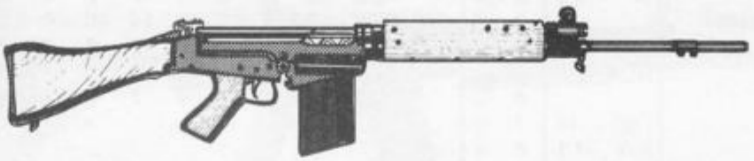
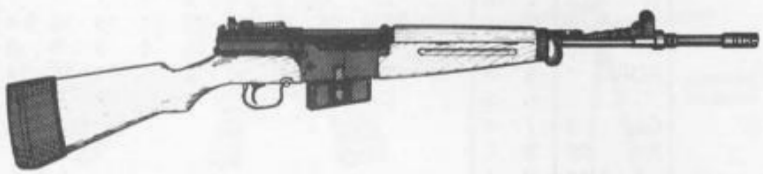
Sub-Machineguns / Tech Level 13

Sub-Machineguns	Physical Data	Aim Time AC Md	Ballistic Data		Range in 2 yard hexes 10	20	40	70	100	200	300	400
PA3 - DM / 9mm Parabellum / Sub-Machinegun / Argentina	L 21/27	1 -23	FMJ	PEN	2.5	2.3	2.0	1.5	1.2	.5	.2	.1
	W 8.7	2 -12		DC	3	3	3	2	2	1	1	1
		3 -9	JHP	PEN	2.4	2.2	1.9	1.5	1.1	.5	.2	.1
	RT 8	4 -8		DC	5	5	4	3	2	1	1	1
	ROF *5	5 -6	AP	PEN	3.6	3.3	2.8	2.2	1.7	.7	.3	.1
		6 -5		DC	3	3	3	2	2	1	1	1
	Cap 25	7 -4										
	AW 1.1	8 -3										
	Mag	9 -2		MA	.2	.4	.9	2	2	4	7	9
	KD 4			BA	46	37	28	21	16	7	1	-2
Standard Sub-Machinegun of the Argentine military.	SAB 3			TOF	0	1	2	4	6	13	21	31
F1 / 9mm Para. / Sub-Machinegun / Australia	L 28	1 -23	FMJ	PEN	2.1	1.9	1.6	1.3	1.0	.4	.2	.1
	W 8.6	2 -12		DC	3	3	2	2	1	1	1	1
		3 -9	JHP	PEN	2.0	1.9	1.6	1.2	.9	.4	.2	.1
	RT 9	4 -8		DC	4	4	3	2	2	1	1	1
	ROF *5	5 -6	AP	PEN	3.0	2.7	2.3	1.8	1.4	.6	.2	.1
		6 -5		DC	3	3	2	2	1	1	1	1
	Cap 34	7 -4										
	AW 1.4	8 -3										
	Mag	9 -3		MA	.2	.4	.8	1	2	4	6	8
	KD 3	10 -2		BA	46	37	28	21	16	6	1	-2
Australian Sub-Machinegun unusual for its top loading magazine.	SAB 3			TOF	1	1	2	4	6	14	24	34
Steyr MPi 81 / 9mm Parabellum / Sub-Machinegun / Austria	L 17/24	1 -22	FMJ	PEN	2.3	2.1	1.8	1.4	1.1	.5	.2	.1
	W 7.8	2 -12		DC	3	3	3	2	1	1	1	1
		3 -9	JHP	PEN	2.2	2.0	1.7	1.3	1.0	.4	.2	.1
	RT 8	4 -7		DC	5	4	4	3	2	1	1	1
	ROF *6	5 -6	AP	PEN	3.2	3.0	2.5	1.9	1.5	.6	.3	.1
		6 -5		DC	3	3	2	2	1	1	1	1
	Cap 32	7 -4										
	AW 1.4	8 -3										
	Mag	9 -2		MA	.3	.5	1	2	3	5	8	11
	KD 3			BA	46	37	28	21	16	7	1	-2
Steyr SMG used by the police & military. Adopted by the Australian army.	SAB 3			TOF	0	1	2	4	6	13	23	32
M61 Skorpion / 32 ACP / Sub-Machine Pistol / Czechoslovakia	L 11/20	1 -19	FMJ	PEN	1.2	1.1	.8	.6	.4	.1		
	W 4.4	2 -11		DC	2	1	1	1	1	1		
		3 -8	JHP	PEN	1.1	1.0	.8	.6	.4	.1		
	RT 7	4 -7		DC	3	2	2	1	1	1		
	ROF *7	5 -6	AP	PEN	1.7	1.5	1.2	.8	.6	.2		
		6 -5		DC	2	1	1	1	1	1		
	Cap 20	7 -4										
	AW .90											
	Mag			MA	.2	.4	.9	1	2	4		
	KD 2			BA	43	35	25	18	13	4		
The Skorpion SMP is intended for vehicular crews and heavily loaded infantry.	SAB 2			TOF	1	1	3	5	7	18		
MAT 49 / 9mm Parabellum / Sub-Machinegun / France	L 18/28	1 -23	FMJ	PEN	2.4	2.2	1.9	1.5	1.1	.5	.2	.1
	W 9.2	2 -12		DC	3	3	3	2	2	1	1	1
		3 -9	JHP	PEN	2.3	2.1	1.8	1.4	1.1	.5	.2	.1
	RT 8	4 -8		DC	5	5	4	3	2	1	1	1
	ROF *5	5 -6	AP	PEN	3.4	3.1	2.6	2.0	1.6	.7	.3	.1
		6 -5		DC	3	3	3	2	2	1	1	1
	Cap 32	7 -4										
	AW 1.5	8 -3										
	Mag	9 -2		MA	.2	.4	.8	1	2	4	6	8
	KD 3			BA	46	37	28	21	16	7	1	-2
Well made weapon used by the French army and former colonies.	SAB 3			TOF	0	1	2	4	6	13	22	32
Heckler & Koch MP5 / 9mm Parabellum / Sub-Machinegun / W Germany	L 19/27	1 -20	FMJ	PEN	2.5	2.3	2.0	1.5	1.2	.5	.2	.1
	W 6.8	2 -10		DC	3	3	3	2	2	1	1	1
		3 -8	JHP	PEN	2.4	2.2	1.9	1.5	1.1	.5	.2	.1
	RT 8	4 -6		DC	5	5	4	3	2	1	1	1
	ROF *7	5 -5	AP	PEN	3.6	3.3	2.8	2.2	1.7	.7	.3	.1
		6 -4		DC	3	3	3	2	2	1	1	1
	Cap 30	7 -3										
	AW 1.2	8 -2										
	Mag	9 -1		MA	.4	.7	1	2	4	7	11	14
	KD 4			BA	46	37	28	21	16	7	1	-2
Widely exported SMG used by W German police & border guards.	SAB 3			TOF	0	1	2	4	6	13	21	31

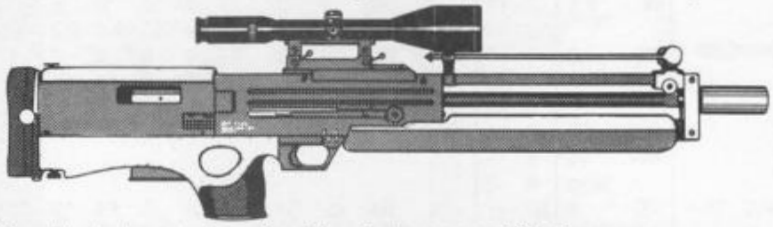
Sub-Machineguns	Physical Data	Aim Time AC Md	Ballistic Data	Range in 2 yard hexes 10 20 40 70 100 200 300 400
Heckler & Koch MP5K / 9mm Parabellum / Sub-Machine Pistol / W Germany	L 13	1 -19	FMJ PEN	2.2 2.0 1.7 1.3 1.0 .4 .2 .1
	W 5.6	2 -11	DC	3 3 2 2 1 1 1 1
		3 -10	JHP PEN	2.1 2.0 1.6 1.3 1.0 .4 .2 .1
	RT 7	4 -9	DC	5 4 4 3 2 1 1 1
	ROF **8	5 -8	AP PEN	3.1 2.9 2.4 1.9 1.4 .6 .3 .1
		6 -7	DC	3 3 2 2 1 1 1 1
	Cap 30	7 -6		
	AW 1.2		3RB	-6 -1 4 8 11 16 19 21
	Mag		MA	.4 .8 2 3 4 8 12 17
	KD 3		BA	46 37 28 21 16 6 1 -2
Short MP5 designed for anti-terrorist units.	SAB 3		TOF	0 1 2 4 6 14 23 33
Heckler & Koch 53 / 5.56mm NATO / Sub-Machinegun / W Germany	L 22/30	1 -21	FMJ PEN	10 9.9 9.0 7.9 6.9 4.4 2.8 1.8
	W 8.1	2 -11	DC	5 5 5 4 4 3 2 1
		3 -8	JHP PEN	10 9.5 8.7 7.5 6.6 4.2 2.7 1.7
	RT 8	4 -7	DC	7 7 6 6 6 5 3 2
	ROF *6	5 -5	AP PEN	15 14 13 11 9.7 6.1 3.9 2.5
		6 -4	DC	5 5 4 4 4 3 2 1
	Cap 40	7 -3		
	AW 1.4	8 -2		
	Mag	9 -1	MA	.3 .5 1 2 3 5 8 11
	KD 4		BA	61 52 44 36 31 22 16 12
Short version of the HK 33 which can be used as an SMG or rifle.	SAB 3		TOF	0 0 1 2 3 6 10 14
Uzi / 9mm Parabellum / Sub-Machinegun / Israel	L 19/26	1 -23	FMJ PEN	2.5 2.3 2.0 1.5 1.2 .5 .2 .1
	W 9.0	2 -12	DC	3 3 3 2 2 1 1 1
		3 -9	JHP PEN	2.4 2.2 1.9 1.5 1.1 .5 .2 .1
	RT 8	4 -8	DC	5 5 4 3 2 1 1 1
	ROF *5	5 -6	AP PEN	3.6 3.3 2.8 2.2 1.7 .7 .3 .1
		6 -5	DC	3 3 3 2 2 1 1 1
	Cap 32	7 -4		
	AW 1.3	8 -3		
	Mag		MA	.2 .4 .9 1 2 4 6 9
	KD 4		BA	46 37 28 21 16 7 1 -2
Sturdy, reliable weapon popular with police and secret service.	SAB 3		TOF	0 1 2 4 6 13 21 31
Mini Uzi / 9mm Parabellum / Sub-Machine Pistol / Israel	L 14/24	1 -22	FMJ PEN	1.9 1.8 1.5 1.1 .9 .4 .1 .1
	W 7.3	2 -12	DC	3 3 2 2 1 1 1 1
		3 -9	JHP PEN	1.9 1.7 1.4 1.1 .8 .3 .1 .1
	RT 7	4 -7	DC	4 4 3 2 1 1 1 1
	ROF *8	5 -6	AP PEN	2.7 2.5 2.1 1.6 1.2 .5 .2 .1
		6 -5	DC	3 2 2 2 1 1 1 1
	Cap 32	7 -4		
	AW 1.3	8 -3		
	Mag		MA	.3 .7 1 2 3 7 10 13
	KD 3		BA	45 37 28 21 16 6 1 -2
Small version of the Uzi intended for police and security forces.	SAB 3		TOF	1 1 2 4 6 15 25 36
Beretta M12S / 9mm Parabellum / Sub-Machinegun / Italy	L 17/26	1 -22	FMJ PEN	2.3 2.1 1.8 1.4 1.1 .5 .2 .1
	W 8.4	2 -12	DC	3 3 3 2 1 1 1 1
		3 -9	JHP PEN	2.2 2.0 1.7 1.3 1.0 .4 .2 .1
	RT 8	4 -7	DC	5 4 4 3 2 1 1 1
	ROF *5	5 -6	AP PEN	3.2 3.0 2.5 1.9 1.5 .6 .3 .1
		6 -5	DC	3 3 2 2 1 1 1 1
	Cap 32	7 -4		
	AW 1.3	8 -3		
	Mag		MA	.2 .4 .8 1 2 4 6 8
	KD 3		BA	46 37 28 21 16 7 1 -2
Widely exported SMG used in Italy, Africa, and South America.	SAB 3		TOF	0 1 2 4 6 13 23 32
Spectre / 9mm Parabellum / Sub-Machinegun / Italy	L 14/23	1 -20	FMJ PEN	2.5 2.3 2.0 1.5 1.2 .5 .2 .1
	W 7.6	2 -10	DC	3 3 3 2 2 1 1 1
		3 -7	JHP PEN	2.4 2.2 1.9 1.5 1.1 .5 .2 .1
	RT 8	4 -5	DC	5 5 4 3 2 1 1 1
	ROF *8	5 -4	AP PEN	3.6 3.3 2.8 2.2 1.7 .7 .3 .1
		6 -3	DC	3 3 3 2 2 1 1 1
	Cap 50	7 -2		
	AW 1.6	8 -1		
	Mag		MA	.4 .8 2 3 4 8 11 15
	KD 4		BA	46 37 28 21 16 7 1 -2
New SMG firing from a closed bolt using a four column magazine.	SAB 3		TOF	0 1 2 4 6 13 21 31

Sub-Machineguns / Tech Level 13

Sub-Machineguns	Physical Data	Aim Time AC Md	Ballistic Data		Range in 2 yard hexes 10	20	40	70	100	200	300	400
Armscor BXP / 9mm Parabellum / Sub-Machinegun / South Africa	L 14/22	1 -21	FMJ	PEN	1.7	1.5	1.3	1.0	.7	.3	.1	
	W 6.3	2 -11		DC	2	2	2	1	1	1	1	
		3 -9	JHP	PEN	1.6	1.5	1.2	.9	.7	.3	.1	
	RT 7	4 -7		DC	4	3	2	2	1	1	1	
	ROF *6	5 -6	AP	PEN	2.3	2.1	1.8	1.3	1.0	.4	.2	
		6 -5		DC	2	2	2	1	1	1	1	
	Cap 32	7 -4										
	AW 1.2	8 -3										
	Mag			MA	.3	.5	1	2	3	5	8	
	KD 3			BA	45	37	28	20	15	6	1	
Compact, light Sub-Machinegun which can be fired one handed.	SAB 3			TOF	1	1	2	5	7	16	27	
AKR / 5.45 x 39.5mm / Sub-Machinegun / USSR	L 17/27	1 -22	FMJ	PEN	11	10	9.4	8.1	7.1	4.4	2.7	1.7
	W 7.3	2 -12		DC	5	5	5	4	4	3	2	1
		3 -9	JHP	PEN	10	9.9	9.0	7.8	6.8	4.2	2.6	1.6
	RT 8	4 -7		DC	7	7	6	6	6	4	3	2
	ROF *7	5 -6	AP	PEN	15	15	13	11	10	6.2	3.8	2.4
		6 -5		DC	5	5	4	4	4	3	2	1
	Cap 30	7 -4										
	AW 1.3	8 -3										
	Mag			MA	.2	.3	.6	1	2	3	5	7
	KD 3			BA	60	52	43	35	31	21	15	12
SMG version of the AKS 74 rifle. In service with Soviet forces.	SAB 3			TOF	0	0	1	2	3	6	9	13
Sterling Mk 7 / 9mm Parabellum / Sub-Machine Pistol / UK	L 14	1 -20	FMJ	PEN	2.3	2.1	1.8	1.4	1.1	.5	.2	.1
	W 5.7	2 -12		DC	3	3	3	2	1	1	1	1
		3 -11	JHP	PEN	2.2	2.0	1.7	1.3	1.0	.4	.2	.1
	RT 8	4 -10		DC	5	4	4	3	2	1	1	1
	ROF *8	5 -9	AP	PEN	3.2	3.0	2.5	1.9	1.5	.6	.3	.1
		6 -8		DC	3	3	2	2	1	1	1	1
	Cap 34	7 -8										
	AW 1.2	8 -7										
	Mag			MA	.4	.8	2	3	4	8	13	17
	KD 3			BA	46	37	28	21	16	7	1	-2
Special purpose paratroopers machine pistol.	SAB 3			TOF	0	1	2	4	6	13	23	32
Ingram MAC 10 / 9mm Parabellum / Sub-Machine Pistol / USA	L 11/22	1 -22	FMJ	PEN	2.1	1.9	1.6	1.3	1.0	.4	.2	.1
	W 7.6	2 -12		DC	3	3	2	2	1	1	1	1
		3 -9	JHP	PEN	2.0	1.9	1.6	1.2	.9	.4	.2	.1
	RT 7	4 -7		DC	4	4	3	2	2	1	1	1
	ROF *9	5 -6	AP	PEN	3.0	2.7	2.3	1.8	1.4	.6	.2	.1
		6 -5		DC	3	3	2	2	1	1	1	1
	Cap 32	7 -4										
	AW 1.4	8 -3										
	Mag			MA	.4	.8	2	3	4	8	12	15
	KD 3			BA	46	37	28	21	16	6	1	-2
Compact Sub-Machinegun chambered for 9mm Parabellum.	SAB 3			TOF	1	1	2	4	6	14	24	34
Ingram MAC 10 / 45 ACP / Sub-Machine Pistol / USA	L 11/22	1 -22	FMJ	PEN	1.7	1.6	1.3	1.0	.8	.4	.2	.1
	W 8.4	2 -12		DC	3	2	2	1	1	1	1	1
		3 -9	JHP	PEN	1.6	1.5	1.3	1.0	.8	.4	.2	.1
	RT 7	4 -7		DC	4	3	3	2	1	1	1	1
	ROF *10	5 -6	AP	PEN	2.4	2.2	1.9	1.5	1.2	.5	.2	.1
		6 -5		DC	3	2	2	1	1	1	1	1
	Cap 30	7 -4										
	AW 2.2	8 -3										
	Mag			MA	.6	1	2	4	6	12	19	25
	KD 5			BA	45	37	28	21	16	6	1	-3
MAC 10 chambered for 45 ACP. Its high recoil hinders one hand fire.	SAB 4			TOF	1	1	3	5	8	18	30	43
Bushmaster / 5.56mm NATO / Sub-Machinegun / USA	L 21	1 -21	FMJ	PEN	13	12	11	9.9	8.6	5.3	3.3	2.1
	W 6.2	2 -12		DC	6	6	5	5	4	3	3	2
		3 -11	JHP	PEN	13	12	11	9.5	8.2	5.1	3.2	2.0
	RT 8	4 -10		DC	7	7	7	7	6	5	4	3
	ROF *6	5 -9	AP	PEN	18	18	16	14	12	7.5	4.7	2.9
		6 -8		DC	6	5	5	5	4	3	3	2
	Cap 30											
	AW 1.0											
	Mag			MA	.3	.7	1	2	3	7	10	13
	KD 4			BA	60	51	42	35	30	20	15	11
Powerful SMG designed for 1 hand fire braced against the forearm.	SAB 3			TOF	0	0	1	2	2	5	8	12

Assault Rifles	Physical Data	Aim Time AC Md	Ballistic Data	Range in 2 yard hexes 10	20	40	70	100	200	300	400
L1A1 - F1 / 7.62mm NATO / Assault Rifle / Australia	L 42	1 -24	FMJ PEN	18	18	17	15	14	9.8	7.0	5.0
	W 12.0	2 -14	DC	8	8	8	7	7	6	6	5
		3 -10	JHP PEN	18	17	16	15	13	9.4	6.7	4.8
	RT 8	4 -8	DC	9	9	9	9	9	8	7	7
	ROF *	5 -6	AP PEN	26	25	24	21	19	14	9.9	7.1
		6 -5	DC	8	7	7	7	7	6	6	5
	Cap 20	7 -4									
	AW 1.6	8 -3									
	Mag	9 -2									
Standard Australian army rifle patterned after the FN FAL. It is being replaced by the Austrian Steyr AUG.	KD 10	10 -1	BA	61	53	45	37	32	23	17	13
	SAB 5	11 0	TOF	0	0	1	2	2	5	8	12
Steyr AUG / 5.56mm NATO / Assault Rifle / Austria	L 31	1 -23	FMJ PEN	15	14	13	11	9.9	6.3	4.0	2.5
	W 9.0	2 -12	DC	6	6	6	5	5	4	3	2
		3 -8	JHP PEN	14	14	12	11	9.5	6.0	3.8	2.4
	RT 10	4 -6	DC	8	8	7	7	7	6	4	3
	ROF *5	5 -5	AP PEN	21	20	18	16	14	8.8	5.6	3.5
		6 -4	DC	6	6	6	5	5	3	3	2
	Cap 30	7 -3									
	AW 1.1	8 -2									
	Mag	9 -1	MA	.2	.5	1	2	2	5	7	10
	KD 4	10 0	BA	60	51	42	35	30	20	15	11
New Austrian rifle with an optical scope in its carrying handle.	SAB 3	11 1	TOF	0	0	1	1	2	5	8	11
FN FAL / 7.62mm NATO / Assault Rifle / Belgium	L 43	1 -24	FMJ PEN	19	19	17	16	14	10	7.4	5.3
	W 10.8	2 -13	DC	8	8	8	7	7	7	6	5
		3 -9	JHP PEN	18	18	17	15	14	9.8	7.1	5.1
	RT 8	4 -8	DC	9	9	9	9	9	8	7	7
	ROF *6	5 -6	AP PEN	27	26	25	22	20	14	10	7.5
		6 -5	DC	8	8	7	7	7	6	6	5
	Cap 20	7 -4									
	AW 1.4	8 -3									
	Mag	9 -2	MA	.6	1	3	4	6	13	19	25
Highly successful weapon exported to over 90 countries including the United Kingdom and Israel.	KD 10	10 -1	BA	61	53	45	37	32	23	17	13
	SAB 5	11 0	TOF	0	0	1	2	2	5	8	11
FN FNC / 5.56mm NATO / Assault Rifle / Belgium	L 30/39	1 -23	FMJ PEN	15	15	14	12	11	7.0	4.6	3.0
	W 9.6	2 -12	DC	6	6	6	6	5	4	3	2
		3 -9	JHP PEN	15	14	13	12	10	6.7	4.4	2.9
	RT 8	4 -7	DC	8	8	7	7	7	6	5	3
	ROF **6	5 -6	AP PEN	22	21	19	17	15	9.9	6.5	4.3
		6 -5	DC	6	6	6	5	5	4	3	2
	Cap 30	7 -4									
	AW 1.2	8 -3	3RB	-4	1	6	10	13	17	20	22
	Mag	9 -2	MA	.3	.6	1	2	3	6	9	12
Modern successor to the FN CAL. This weapon has three round burst capability and like the FN FAL has been marketed for export.	KD 4	10 -1	BA	61	53	44	37	32	22	17	13
	SAB 3	11 0	TOF	0	0	1	2	2	5	8	11
M1949 - 56 / 7.5 x 54mm / Assault Rifle / France	L 40	1 -23	FMJ PEN	18	18	17	15	14	9.7	7.0	5.0
	W 9.6	2 -12	DC	7	7	7	7	7	6	6	5
		3 -9	JHP PEN	17	17	16	14	13	9.4	6.7	4.8
	RT 8	4 -7	DC	9	9	9	9	8	8	7	7
	ROF *	5 -6	AP PEN	26	25	23	21	19	14	9.9	7.1
		6 -5	DC	7	7	7	7	7	6	5	4
	Cap 10	7 -4									
	AW .95	8 -3									
	Mag	9 -2									
This French army rifle is still in service and is being replaced by the FA MAS. The FA MAS is currently only available to elite troops.	KD 9	10 -1	BA	62	54	45	38	33	24	18	14
	SAB 5	11 0	TOF	0	0	1	2	2	5	8	12
FA MAS / 5.56mm NATO / Assault Rifle / France	L 30	1 -23	FMJ PEN	15	15	13	12	10	6.4	4.1	2.6
	W 9.0	2 -12	DC	6	6	6	6	5	4	3	2
		3 -9	JHP PEN	15	14	13	11	9.7	6.2	3.9	2.5
	RT 10	4 -7	DC	8	8	7	7	7	6	4	3
	ROF **8	5 -6	AP PEN	22	21	19	16	14	9.1	5.8	3.7
		6 -4	DC	6	6	6	5	5	4	3	2
	Cap 25	7 -3									
	AW 1.0	8 -2	3RB	-6	-1	4	8	10	15	18	20
	Mag	9 -1	MA	.4	.8	2	3	4	8	12	16
	KD 4		BA	60	51	42	35	30	20	15	11
New French army rifle of lightweight, bullpup design.	SAB 3		TOF	0	0	1	1	2	5	8	11

Assault Rifles / Tech Level 13

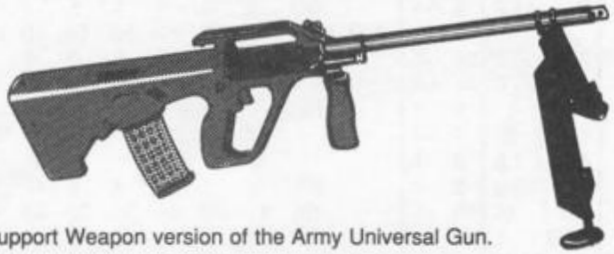
Assault Rifles	Physical Data	Aim Time AC	Aim Time Md	Ballistic Data		Range in 2 yard hexes 10	20	40	70	100	200	300	400
FR F2 / 7.62mm NATO / Sniper Rifle / France	L 45	1	-24	FMJ	PEN	20	19	18	16	15	11	7.6	5.5
	W 12.5	2	-14		DC	8	8	8	7	7	7	6	5
		3	-7	JHP	PEN	19	18	17	16	14	10	7.3	5.3
	RT 8	4	-5		DC	9	9	9	9	9	8	8	7
	ROF 3	5	-4	AP	PEN	28	27	25	23	21	15	11	7.7
		6	-2		DC	8	8	7	7	7	6	6	5
	Cap 10	7	0										
	AW 1.1	8	1										
	Mag	9	2										
	KD 10	10	3		BA	68	59	50	43	38	28	22	18
French sniper rifle with optical scope and bipod chambered in 7.62mm NATO.	SAB 5	12	5		TOF	0	0	1	2	2	5	8	11
Heckler & Koch G3 / 7.62mm NATO / Assault Rifle / W Germany	L 40	1	-24	FMJ	PEN	17	16	15	14	13	8.9	6.3	4.5
	W 11.1	2	-14		DC	8	7	7	7	7	6	6	4
		3	-9	JHP	PEN	16	16	15	13	12	8.5	6.1	4.3
	RT 8	4	-8		DC	9	9	9	9	8	8	7	6
	ROF *5	5	-6	AP	PEN	24	23	22	20	18	13	8.9	6.4
		6	-5		DC	7	7	7	7	7	6	5	4
	Cap 20	7	-4										
	AW 1.4	8	-3										
	Mag	9	-2		MA	.5	1	2	3	5	10	14	19
Standard rifle of the West German army. It is also widely used in Africa and South America.	KD 10	10	-1		BA	61	53	44	37	32	23	17	13
	SAB 5	11	0		TOF	0	0	1	2	3	5	9	12
Heckler & Koch G41 / 5.56mm NATO / Assault Rifle / W Germany	L 39	1	-23	FMJ	PEN	16	15	14	13	11	7.4	4.9	3.2
	W 8.6	2	-12		DC	6	6	6	6	5	4	3	2
		3	-9	JHP	PEN	15	15	14	12	11	7.1	4.7	3.1
	RT 8	4	-7		DC	8	8	8	7	7	6	5	4
	ROF **7	5	-6	AP	PEN	23	22	20	18	16	10	6.9	4.5
		6	-5		DC	6	6	6	5	5	4	3	2
	Cap 30	7	-4										
	AW 1.1	8	-3		3RB	-4	1	5	9	12	17	20	22
	Mag	9	-2		MA	.4	.8	2	3	4	8	11	15
5.56mm NATO version of the G3. This weapon is considerably lighter than the G3 and has three round burst capability.	KD 4	10	-1		BA	61	53	44	37	32	22	17	13
	SAB 3	11	0		TOF	0	0	1	1	2	5	8	11
Heckler & Koch G11 / 4.7mm Caseless / Assault Rifle / W Germany	L 30	1	-23	FMJ	PEN	18	18	17	15	14	9.9	7.1	5.1
	W 8.7	2	-12		DC	5	5	5	5	4	4	3	3
		3	-8	JHP	PEN	18	17	16	15	13	9.5	6.8	4.9
	RT 10	4	-6		DC	7	7	7	7	6	6	5	4
	ROF **5	5	-5	AP	PEN	26	25	24	21	19	14	10	7.2
		6	-4		DC	5	5	5	5	4	3	3	3
	Cap 50	7	-3										
	AW .77	8	-2		3RB	-20	-16	-11	-7	-4	1	4	6
	Mag	9	-1		MA	.2	.5	.9	2	2	5	7	9
	KD 4	10	0		BA	64	57	49	43	38	29	23	19
Advanced caseless rifle under development.	SAB 3	11	1		TOF	0	0	1	1	2	5	7	10
Walther 2000 / 300 Winchester Magnum / Sniper Rifle / W Germany	L 36	1	-26	FMJ	PEN	28	27	25	24	22	17	13	9.8
	W 18.3	2	-16		DC	8	8	8	8	8	7	7	7
		3	-8	JHP	PEN	26	26	24	23	21	16	12	9.4
	RT 10	4	-6		DC	10	10	10	10	9	9	9	8
	ROF *	5	-4	AP	PEN	39	38	36	33	31	24	18	14
		6	-3		DC	8	8	8	8	8	7	7	6
	Cap 6	7	-1										
	AW .90	8	0										
	Mag	9	1										
	KD 13	10	2		BA	70	62	53	46	41	32	26	22
Specially designed sniper rifle with optical scope and bipod.	SAB 5	12	5		TOF	0	0	1	1	2	5	7	10
AMD 65 / 7.62 x 39mm / Assault Rifle / Hungary	L 26/34	1	-23	FMJ	PEN	11	10	9.4	8.3	7.2	4.6	3.0	1.9
	W 9.0	2	-13		DC	7	7	6	6	6	5	3	2
		3	-9	JHP	PEN	10	9.9	9.1	7.9	6.9	4.4	2.8	1.8
	RT 8	4	-7		DC	8	8	8	8	7	7	5	3
	ROF *5	5	-6	AP	PEN	15	15	13	12	10	6.5	4.2	2.7
		6	-4		DC	6	6	6	6	6	4	3	2
	Cap 30	7	-3										
	AW 1.8	8	-2										
	Mag				MA	.4	.8	2	3	4	8	12	16
	KD 7				BA	58	50	40	33	28	18	13	9
Hungarian modified AKM 63 with folding stock and foregrip.	SAB 4				TOF	0	1	1	2	3	6	10	15

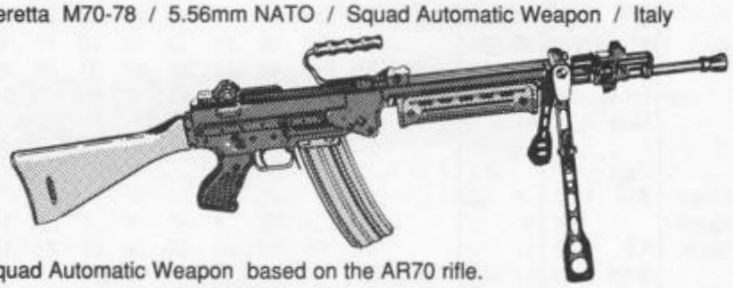
Assault Rifles	Physical Data	Aim Time AC Md	Ballistic Data	Range in 2 yard hexes 10 20 40 70 100 200 300 400
Galil AR / 5.56mm NATO / Assault Rifle / Israel	L 29/39	1 -23	FMJ PEN	16 15 14 12 11 6.8 4.3 2.7
	W 10.2	2 -13	DC	6 6 6 6 5 4 3 2
		3 -9	JHP PEN	15 15 13 12 10 6.5 4.1 2.6
	RT 8	4 -7	DC	8 8 8 7 7 6 5 3
	ROF *5	5 -6	AP PEN	22 21 20 17 15 9.5 6.1 3.9
		6 -5	DC	6 6 6 5 5 4 3 2
	Cap 35	7 -4		
	AW 1.6	8 -3		
	Mag	9 -2	MA	.2 .5 .9 2 2 5 7 9
	KD 4	10 -1	BA	60 51 42 35 30 20 15 11
Galil Assault Rifle in 5.56mm NATO.	SAB 3	11 0	TOF	0 0 1 1 2 5 7 11
Galil AR / 7.62mm NATO / Assault Rifle / Israel	L 32/41	1 -24	FMJ PEN	20 19 18 16 15 11 7.6 5.5
	W 10.7	2 -13	DC	8 8 8 7 7 7 6 5
		3 -9	JHP PEN	19 18 17 16 14 10 7.3 5.2
	RT 8	4 -7	DC	9 9 9 9 9 8 8 7
	ROF *5	5 -6	AP PEN	28 27 25 23 21 15 11 7.7
		6 -5	DC	8 8 7 7 7 6 6 5
	Cap 25	7 -4		
	AW 2.0	8 -3		
	Mag	9 -2	MA	.5 1 2 4 5 11 16 21
Galil Assault Rifle in 7.62mm NATO. This weapon & the 5.56mm version are also available in a Short Assault Rifle (SAR) variant which is about 5 inches shorter.	KD 10	10 -1	BA	61 53 45 37 32 23 17 13
	SAB 5	11 0	TOF	0 0 1 2 2 5 8 11
Beretta BM 59 / 7.62mm NATO / Assault Rifle / Italy	L 43	1 -24	FMJ PEN	18 18 17 15 14 9.8 7.0 5.0
	W 11.3	2 -14	DC	8 8 8 7 7 6 6 5
		3 -9	JHP PEN	18 17 16 15 13 9.4 6.7 4.8
	RT 8	4 -8	DC	9 9 9 9 9 8 7 7
	ROF *6	5 -6	AP PEN	26 25 24 21 19 14 9.9 7.1
		6 -5	DC	8 7 7 7 7 6 6 5
	Cap 20	7 -4		
	AW 1.5	8 -3		
	Mag	9 -2	MA	.6 1 2 4 6 12 18 24
	KD 10	10 -1	BA	61 53 45 37 32 23 17 13
Standard rifle of the Italian army. Similar to the M1 Garand.	SAB 5	11 0	TOF	0 0 1 2 2 5 8 12
Beretta SC 70 / 5.56mm NATO / Assault Rifle / Italy	L 29/38	1 -23	FMJ PEN	15 14 13 11 10 6.3 4.0 2.5
	W 9.3	2 -12	DC	6 6 6 5 5 4 3 2
		3 -9	JHP PEN	14 14 13 11 9.5 6.0 3.8 2.4
	RT 8	4 -7	DC	8 8 7 7 7 6 4 3
	ROF *5	5 -6	AP PEN	21 20 18 16 14 8.8 5.6 3.5
		6 -5	DC	6 6 6 5 5 4 3 2
	Cap 30	7 -4		
	AW 1.1	8 -3		
	Mag	9 -2	MA	.2 .5 1 2 2 5 7 10
Folding stock version of the Beretta AR 70 rifle. This weapon is replacing the BM 59 and is in service with the Italian Special Forces.	KD 4	10 -1	BA	60 51 42 35 30 20 15 11
	SAB 3	11 0	TOF	0 0 1 1 2 5 8 11
Type 64 / 7.62mm NATO (reduced load) / Assault Rifle / Japan	L 39	1 -24	FMJ PEN	13 13 12 11 9.7 6.7 4.7 3.3
	W 11.3	2 -14	DC	7 7 7 7 6 6 4 3
		3 -9	JHP PEN	13 12 11 10 9.3 6.5 4.5 3.2
	RT 8	4 -8	DC	9 9 8 8 8 7 6 5
	ROF *4	5 -6	AP PEN	19 18 17 15 14 9.5 6.6 4.6
		6 -5	DC	7 7 7 6 6 6 4 3
	Cap 20	7 -4		
	AW 1.6	8 -3		
	Mag	9 -2	MA	.3 .7 1 2 3 7 10 14
Standard rifle of the Japanese army using a reduced load 7.62mm round.	KD 8	10 -1	BA	61 53 44 37 32 22 17 13
	SAB 5	11 0	TOF	0 1 1 2 3 6 10 14
R4 / 5.56mm NATO / Assault Rifle / South Africa	L 29/40	1 -24	FMJ PEN	16 15 14 12 10 6.5 4.1 2.6
	W 11.2	2 -14	DC	6 6 6 6 5 4 3 2
		3 -9	JHP PEN	15 14 13 11 10 6.3 4.0 2.5
	RT 8	4 -7	DC	8 8 8 7 7 6 4 3
	ROF *5	5 -6	AP PEN	22 21 19 17 15 9.2 5.8 3.7
		6 -5	DC	6 6 6 5 5 4 3 2
	Cap 35	7 -4		
	AW 1.8	8 -3		
	Mag	9 -2	MA	.2 .4 .9 1 2 4 6 9
	KD 4	10 -1	BA	59 51 42 35 30 20 14 11
Modified Galil AR. South African Defense Force's standard rifle.	SAB 3		TOF	0 0 1 1 2 5 7 11

Assault Rifles	Physical Data	Aim Time AC Md	Ballistic Data	Range in 2 yard hexes 10 20 40 70 100 200 300 400
SIG 550 / 5.56mm NATO / Assault Rifle / Switzerland	L 30/39 W 10.1 RT 7 ROF **7 Cap 30 AW 1.1 Mag KD 4 SAB 3	1 -23 2 -13 3 -9 4 -7 5 -6 6 -5 7 -4 8 -3 9 -2 10 -1 11 0	FMJ PEN 15 15 13 12 10 6.4 4.1 2.6 DC 6 6 6 6 5 4 3 2 JHP PEN 15 14 13 11 9.7 6.2 3.9 2.5 DC 8 8 7 7 7 6 4 3 AP PEN 21 21 19 16 14 9.1 5.7 3.6 DC 6 6 6 5 5 4 3 2 3RB -6 -1 4 8 11 16 19 21 MA .3 .6 1 2 3 6 10 13 BA 60 51 42 35 30 20 15 11 TOF 0 0 1 1 2 5 8 11
 Standard Swiss army rifle adopted in 1984.				
AKM 47 / 7.62 x 39mm / Assault Rifle / USSR	L 35 W 8.7 RT 8 ROF *5 Cap 30 AW 1.8 Mag KD 7 SAB 5	1 -23 2 -12 3 -9 4 -7 5 -6 6 -4 7 -3 8 -2 9 -1	FMJ PEN 11 11 9.8 8.6 7.5 4.8 3.1 2.0 DC 7 7 6 6 6 5 3 2 JHP PEN 11 10 9.4 8.3 7.2 4.7 3.0 1.9 DC 8 8 8 8 7 7 5 3 AP PEN 16 15 14 12 11 6.8 4.4 2.8 DC 7 6 6 6 6 4 3 2 MA .4 .8 2 3 4 8 12 17 BA 58 50 40 33 28 18 13 9 TOF 0 1 1 2 3 6 10 14
 New model AK 47. The most widely exported communist weapon.				
AK 74 / 5.45 x 39.5mm / Assault Rifle / USSR	L 37 W 8.7 RT 8 ROF *5 Cap 30 AW 1.1 Mag KD 4 SAB 2	1 -23 2 -12 3 -9 4 -7 5 -6 6 -4 7 -3 8 -2 9 -1	FMJ PEN 14 13 12 10 9.1 5.8 3.7 2.4 DC 6 6 5 5 4 3 3 2 JHP PEN 13 13 11 10 8.8 5.6 3.6 2.3 DC 7 7 7 7 6 5 4 3 AP PEN 19 18 17 15 13 8.2 5.2 3.3 DC 6 5 5 5 4 3 3 2 MA .2 .3 .5 .9 1 3 4 5 BA 60 52 43 36 31 21 16 12 TOF 0 0 1 2 2 5 8 12
 New Soviet rifle with an effective muzzle brake. It is replacing the AKM 47.				
Dragunov SVD / 7.62 x 54mm / Sniper Rifle / USSR	L 48 W 10.2 RT 8 ROF * Cap 10 AW .68 Mag KD 12 SAB 6	1 -22 2 -12 3 -7 4 -5 5 -4 6 -2 7 0 8 1 9 2 10 3 11 4	FMJ PEN 23 22 21 19 18 14 10 7.8 DC 8 8 8 8 8 7 7 6 JHP PEN 22 21 20 19 17 13 9.9 7.5 DC 10 9 9 9 9 9 8 8 AP PEN 32 31 30 27 25 19 15 11 DC 8 8 8 8 7 7 6 6 BA 69 62 53 46 41 32 26 22 TOF 0 0 1 2 2 5 8 11
 The Dragunov is equipped with a PSO-1 4x optical sight whose reticle is illuminated by a small battery. The scope is capable of detecting an infra-red source.				
L1A1 / 7.62mm NATO / Assault Rifle / UK	L 45 W 11.0 RT 8 ROF * Cap 20 AW 1.5 Mag KD 10 SAB 5	1 -24 2 -14 3 -9 4 -8 5 -6 6 -5 7 -4 8 -3 9 -2 10 -1 11 0	FMJ PEN 19 19 17 16 14 10 7.3 5.3 DC 8 8 8 7 7 7 6 5 JHP PEN 18 18 17 15 14 9.8 7.0 5.1 DC 9 9 9 9 9 8 7 7 AP PEN 27 26 24 22 20 14 10 7.4 DC 8 8 7 7 7 6 6 5 BA 61 53 45 37 32 23 17 13 TOF 0 0 1 2 2 5 8 12
 Patterned on the FN FAL, the L1A1 is the standard British service rifle. Normally a semi-automatic weapon, it can easily be modified for fully automatic fire.				
Enfield IW / 5.56mm NATO / Assault Rifle / UK	L 31 W 9.2 RT 10 ROF *6 Cap 30 AW 1.0 Mag KD 4 SAB 3	1 -23 2 -12 3 -8 4 -6 5 -5 6 -4 7 -3 8 -2 9 -1 10 0 11 1	FMJ PEN 16 16 14 13 11 7.5 4.9 3.3 DC 6 6 6 6 5 4 3 2 JHP PEN 16 15 14 12 11 7.2 4.7 3.1 DC 8 8 8 7 7 6 5 4 AP PEN 23 22 20 18 16 11 7.0 4.6 DC 6 6 6 5 5 4 3 2 MA .3 .6 1 2 3 6 9 13 BA 61 53 44 37 32 22 17 13 TOF 0 0 1 1 2 5 8 11
 New British rifle replacing the L1A1.				

Assault Rifles	Physical Data	Aim Time AC Md	Ballistic Data	Range in 2 yard hexes 10 20 40 70 100 200 300 400
M 14 / 7.62mm NATO / Assault Rifle / USA	L 44 W 11.2 RT 8 ROF *6 Cap 20 AW 1.5 Mag KD 10 SAB 5	1 -24 2 -14 3 -10 4 -8 5 -6 6 -5 7 -4 8 -3 9 -2 10 -1 12 0	FMJ PEN 20 19 18 16 15 11 7.7 5.5 DC 8 8 8 7 7 7 6 5 JHP PEN 19 18 17 16 14 10 7.4 5.3 DC 9 9 9 9 9 8 8 7 AP PEN 28 27 25 23 21 15 11 7.8 DC 8 8 7 7 7 6 6 5 MA .6 1 2 4 6 12 19 25 BA 61 53 45 37 32 23 17 13 TOF 0 0 1 2 2 5 8 11
 Standard US army rifle adopted in 1957. The M14 was often replaced by the M16 starting in 1962 but remains in service. Most noteably with the US Marine Corp.				
M16A1 / 5.56mm NATO / Assault Rifle / USA	L 39 W 8.0 RT 8 ROF *7 Cap 30 AW 1.0 Mag KD 4 SAB 3	1 -22 2 -12 3 -9 4 -7 5 -6 6 -5 7 -4 8 -3 9 -2 10 -1 11 0	FMJ PEN 17 16 15 13 11 7.1 4.5 2.9 DC 6 6 6 6 5 4 3 2 JHP PEN 16 15 14 12 11 6.8 4.4 2.8 DC 8 8 8 7 7 6 5 3 AP PEN 23 22 20 18 16 10 6.4 4.1 DC 6 6 6 6 5 4 3 2 MA .4 .8 2 3 4 8 11 15 BA 60 51 42 35 30 20 15 11 TOF 0 0 1 1 2 4 7 10
 Standard US army rifle adopted in 1962, it was used extensively in Vietnam.				
CAR 16 / 5.56mm NATO / Assault Rifle / USA	L 28/31 W 7.1 RT 8 ROF *7 Cap 30 AW 1.0 Mag KD 4 SAB 3	1 -22 2 -11 3 -9 4 -7 5 -5 6 -4 7 -3 8 -2 9 -1	FMJ PEN 14 13 12 11 9.3 5.9 3.7 2.3 DC 6 6 6 5 5 4 3 2 JHP PEN 14 13 12 10 8.9 5.6 3.5 2.2 DC 8 7 7 7 7 6 4 3 AP PEN 20 19 17 15 13 8.3 5.2 3.3 DC 6 6 5 5 4 3 3 2 MA .4 .8 2 3 4 8 11 15 BA 60 51 42 35 30 20 15 11 TOF 0 0 1 1 2 5 8 11
 Shortened M16 with folding stock often used by officers and NCOs.				
M16A2 / 5.56mm NATO / Assault Rifle / USA	L 39 W 8.5 RT 8 ROF **7 Cap 30 AW 1.0 Mag KD 4 SAB 3	1 -22 2 -12 3 -9 4 -7 5 -6 6 -5 7 -4 8 -3 9 -2 10 -1 11 0	FMJ PEN 17 16 15 13 12 7.7 5.1 3.4 DC 6 6 6 6 5 4 3 3 JHP PEN 16 15 14 13 11 7.4 4.9 3.2 DC 8 8 8 7 7 6 5 4 AP PEN 24 23 21 18 16 11 7.2 4.8 DC 6 6 6 5 5 4 3 2 3RB -5 0 5 9 11 16 19 21 MA .4 .8 2 3 4 8 11 15 BA 61 53 44 37 32 22 17 13 TOF 0 0 1 1 2 5 7 11
 Late version of the M16A1 with three round burst capability.				
M203 / 5.56mm NATO / Assault Rifle - Grenade Launcher / USA	L 39 W 11.6 RT 8 ROF *7 Cap 30 AW 1.0 Mag KD 4 SAB 3	1 -25 2 -15 3 -9 4 -8 5 -6 6 -5 7 -4 8 -3 9 -2 10 -1 11 0	FMJ PEN 17 16 15 13 11 7.1 4.5 2.9 DC 6 6 6 6 5 4 3 2 JHP PEN 16 15 14 12 11 6.8 4.4 2.8 DC 8 8 8 7 7 6 5 3 AP PEN 23 22 20 18 16 10 6.4 4.1 DC 6 6 6 6 5 4 3 2 MA .4 .8 2 3 4 8 11 15 BA 60 51 42 35 30 20 15 11 TOF 0 0 1 1 2 4 7 10
 M16A1 with 40mm grenade launcher. It replaced the M79 grenade launcher.				
M40A1 / 7.62mm NATO / Sniper Rifle / USA	L 44 W 14.8 RT 16 ROF 3 Cap 5 AW .06 Rnd KD 10 SAB 5	1 -25 2 -15 3 -8 4 -6 5 -4 6 -3 7 -1 8 1 9 2 10 3 12 4	FMJ PEN 20 19 18 16 15 11 7.7 5.5 DC 8 8 8 7 7 7 6 5 JHP PEN 19 18 17 16 14 10 7.4 5.3 DC 9 9 9 9 9 8 8 7 AP PEN 28 27 25 23 21 15 11 7.8 DC 8 8 7 7 7 6 6 5 BA 68 59 50 43 38 28 22 18 TOF 0 0 1 2 2 5 8 11
 Remington bolt action rifle with heavy barrel and USMC 10x sniper scope. This is the standard sniper's weapon of the US Marine Corps.				

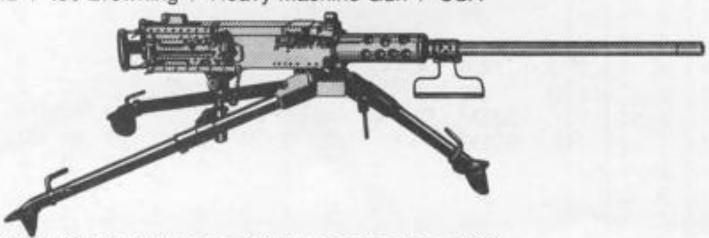
Machine Guns / Tech Level 13

Machine Guns	Physical Data	Aim Time AC Md	Ballistic Data	Range in 2 yard hexes 10 20 40 70 100 200 300 400
Steyr LSW / 5.56mm NATO / Squad Automatic Weapon / Austria	L 35	1 -24	FMJ PEN	17 16 15 13 11 7.1 4.5 2.9
	W 12.3	2 -14	DC	6 6 6 6 5 4 3 2
		3 -8	JHP PEN	16 15 14 12 11 6.8 4.4 2.8
	RT 8	4 -6	DC	8 8 8 7 7 6 5 3
	ROF *6	5 -5	AP PEN	23 22 20 18 16 10 6.4 4.1
		6 -4	DC	6 6 6 6 5 4 3 2
	Cap 42	7 -3		
	AW 1.5	8 -2		
	Mag	9 -1	MA	.2 .4 .9 2 2 4 7 9
	KD 4	10 0	BA	60 51 42 35 30 20 15 11
Light Support Weapon version of the Army Universal Gun.	SAB 2	12 1	TOF	0 0 1 1 2 4 7 10
FN MAG / 7.62mm NATO / General Purpose Machine Gun / Belgium	L 50	1 -29	FMJ PEN	19 19 17 16 14 10 7.4 5.3
	W 27.2	2 -19	DC	8 8 8 7 7 7 6 5
		3 -13	JHP PEN	18 18 17 15 14 9.8 7.1 5.1
	RT 12	4 -9	DC	9 9 9 9 9 8 7 7
	ROF *6	5 -8	AP PEN	27 26 25 22 20 14 10 7.5
		6 -6	DC	8 8 7 7 7 6 6 5
	Cap 50	7 -5		
	AW 3.2	8 -4		
	Blt	10 -2	MA	.3 .6 1 2 3 6 9 12
	KD 10	12 -1	BA	61 53 45 37 32 23 17 13
Reliable weapon considered one of the best GPMGs made.	SAB 3	14 1	TOF	0 0 1 2 2 5 8 11
Type 67 / 7.62 x 54mm / Light Machine Gun / China	L 45	1 -29	FMJ PEN	23 22 21 20 18 14 10 8.0
	W 27.7	2 -20	DC	8 8 8 8 8 7 7 6
		3 -13	JHP PEN	22 22 20 19 17 13 10 7.6
	RT 12	4 -9	DC	10 9 9 9 9 9 8 8
	ROF *5	5 -8	AP PEN	33 32 30 28 25 19 15 11
		6 -6	DC	8 8 8 8 7 7 6 6
	Cap 100	7 -5		
	AW 5.8	8 -4		
	Blt	9 -3	MA	.3 .6 1 2 3 6 10 13
	KD 12	10 -2	BA	63 56 48 41 36 27 21 17
Chinese designed machine gun adopted in the early 1970s.	SAB 4	12 0	TOF	0 0 1 2 2 5 8 11
AA 7.62 / 7.62mm NATO / General Purpose Machine Gun / France	L 39/45	1 -30	FMJ PEN	19 19 17 16 14 10 7.4 5.3
	W 28.5	2 -20	DC	8 8 8 7 7 7 6 5
		3 -14	JHP PEN	19 18 17 15 14 9.9 7.1 5.1
	RT 12	4 -9	DC	9 9 9 9 9 8 7 7
	ROF *6	5 -8	AP PEN	27 26 25 22 20 15 10 7.5
		6 -6	DC	8 8 7 7 7 6 6 5
	Cap 100	7 -5		
	AW 6.5	8 -4		
	Blt	9 -3	MA	.3 .6 1 2 3 6 10 13
	KD 10	10 -2	BA	61 53 45 37 32 23 17 13
Standard MG of the French army. AA 52 converted to 7.62mm NATO.	SAB 3	12 0	TOF	0 0 1 2 2 5 8 11
Heckler & Koch 13E / 5.56mm NATO / Squad Automatic Weapon / W Germany	L 41	1 -27	FMJ PEN	17 16 15 13 12 7.7 5.1 3.4
	W 18.7	2 -17	DC	6 6 6 6 5 4 3 3
		3 -11	JHP PEN	16 15 14 13 11 7.3 4.9 3.2
	RT 8	4 -8	DC	8 8 8 7 7 6 5 4
	ROF **6	5 -7	AP PEN	23 23 21 18 16 11 7.2 4.8
		6 -6	DC	6 6 6 5 5 4 3 2
	Cap 30	7 -4		
	AW 1.1	8 -3	3RB	-8 -3 2 6 9 14 17 19
	Mag	9 -3	MA	.2 .3 .7 1 2 3 5 7
	KD 4	10 -2	BA	61 53 44 37 32 22 17 13
Squad Automatic Weapon version of the HK 13 LMG.	SAB 2	12 0	TOF	0 0 1 1 2 5 7 11
Heckler & Koch 11E / 7.62mm NATO / Squad Automatic Weapon / W Germany	L 41	1 -27	FMJ PEN	17 17 16 14 13 9.2 6.5 4.7
	W 19.5	2 -17	DC	8 8 7 7 7 6 6 4
		3 -11	JHP PEN	17 16 15 14 12 8.8 6.3 4.5
	RT 8	4 -9	DC	9 9 9 9 9 8 7 6
	ROF **7	5 -7	AP PEN	25 24 22 20 18 13 9.2 6.6
		6 -6	DC	7 7 7 7 7 6 5 4
	Cap 20	7 -5		
	AW 1.5	8 -4	3RB	-4 1 6 10 13 17 20 22
	Mag	9 -3	MA	.4 .8 2 3 4 8 12 16
	KD 10	10 -2	BA	61 53 45 37 32 23 17 13
Squad Automatic W eapon variant of the HK 11A1 LMG.	SAB 4	12 0	TOF	0 0 1 2 2 5 9 12

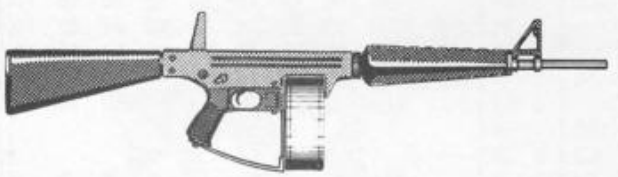
Machine Guns	Physical Data	Aim Time AC Md	Ballistic Data		Range in 2 yard hexes 10	20	40	70	100	200	300	400
Heckler & Koch 23E / 5.56mm NATO / General Purpose MG / W Germany	L 41	1 -29	FMJ	PEN	16	16	15	13	11	7.6	5.0	3.3
	W 25.5	2 -19		DC	6	6	6	6	5	4	3	3
		3 -12	JHP	PEN	16	15	14	12	11	7.3	4.8	3.2
	RT 12	4 -9		DC	8	8	8	7	7	6	5	4
	ROF **6	5 -7	AP	PEN	23	22	21	18	16	11	7.1	4.7
		6 -6		DC	6	6	6	5	5	4	3	2
	Cap 200	7 -5										
	AW 6.2	8 -4		3RB	-8	-3	2	6	8	13	16	18
	Blt	9 -3		MA	.2	.3	.7	1	2	3	5	7
	KD 4	10 -2		BA	61	53	44	37	32	22	17	13
New version of the HK 21A1 in 5.56mm NATO.	SAB 2	12 0		TOF	0	0	1	1	2	5	8	11
Heckler & Koch 21E / 7.62mm NATO / General Purpose MG / W Germany	L 45	1 -29	FMJ	PEN	19	19	17	16	14	10	7.4	5.3
	W 27.0	2 -19		DC	8	8	8	7	7	7	6	5
		3 -13	JHP	PEN	19	18	17	15	14	9.9	7.1	5.1
	RT 12	4 -9		DC	9	9	9	9	9	8	7	7
	ROF **7	5 -8	AP	PEN	27	26	25	22	20	15	10	7.5
		6 -6		DC	8	8	7	7	7	6	6	5
	Cap 100	7 -5										
	AW 6.5	8 -4		3RB	-4	1	6	10	12	17	20	22
	Blt	9 -3		MA	.4	.8	2	3	4	8	12	16
	KD 10	10 -2		BA	61	53	45	37	32	23	17	13
Newest version of the HK 21A1.	SAB 3	12 0		TOF	0	0	1	2	2	5	8	11
MG3 / 7.62mm NATO / General Purpose Machine Gun / W Germany	L 48	1 -30	FMJ	PEN	18	18	17	15	14	9.7	7.0	5.0
	W 30.9	2 -20		DC	8	8	7	7	7	6	6	5
		3 -14	JHP	PEN	18	17	16	14	13	9.3	6.7	4.8
	RT 12	4 -10		DC	9	9	9	9	9	8	7	7
	ROF *10	5 -8	AP	PEN	26	25	23	21	19	14	9.8	7.0
		6 -6		DC	8	7	7	7	7	6	6	5
	Cap 100	7 -5										
	AW 6.5	8 -4										
	Blt	9 -3		MA	.5	1	2	3	5	10	14	19
	KD 10	10 -2		BA	61	53	45	37	32	23	17	13
The MG3 is based on the World War ii MG42	SAB 3	11 -1		TOF	0	0	1	2	2	5	8	12
Galil ARM / 5.56mm NATO / Squad Automatic Weapon / Israel	L 29/39	1 -24	FMJ	PEN	16	15	14	12	11	6.8	4.3	2.7
	W 11.5	2 -14		DC	6	6	6	6	5	4	3	2
		3 -9	JHP	PEN	15	15	13	12	10	6.5	4.1	2.6
	RT 8	4 -8		DC	8	8	8	7	7	6	5	3
	ROF *5	5 -6	AP	PEN	22	21	20	17	15	9.5	6.1	3.9
		6 -5		DC	6	6	6	5	5	4	3	2
	Cap 50	7 -4										
	AW 2.2	8 -3										
	Mag	9 -2		MA	.2	.4	.8	1	2	4	6	8
	KD 4	10 -1		BA	60	51	42	35	30	20	15	11
SAW version of the Galil Assault Rifle & light Machine gun (ARM).	SAB 2	11 0		TOF	0	0	1	1	2	5	7	11
Beretta M70-78 / 5.56mm NATO / Squad Automatic Weapon / Italy	L 38	1 -25	FMJ	PEN	16	15	14	12	10	6.6	4.2	2.7
	W 13.4	2 -15		DC	6	6	6	6	5	4	3	2
		3 -10	JHP	PEN	15	14	13	11	10	6.3	4.0	2.6
	RT 8	4 -8		DC	8	8	8	7	7	6	4	3
	ROF *6	5 -6	AP	PEN	22	21	19	17	15	9.3	5.9	3.8
		6 -5		DC	6	6	6	5	5	4	3	2
	Cap 40	7 -4										
	AW 1.7	8 -3										
	Mag	9 -2		MA	.2	.4	.8	1	2	4	6	8
	KD 4	10 -1		BA	60	51	42	35	30	20	15	11
Squad Automatic Weapon based on the AR70 rifle.	SAB 2	11 0		TOF	0	0	1	1	2	5	8	11
RPK 74 / 5.45 x 39.5mm / Squad Automatic Weapon / USSR	L 45	1 -24	FMJ	PEN	17	16	15	13	12	7.5	4.9	3.2
	W 11.4	2 -14		DC	6	6	6	6	5	4	3	2
		3 -10	JHP	PEN	16	16	14	13	11	7.2	4.7	3.1
	RT 8	4 -8		DC	8	8	8	7	7	6	5	4
	ROF *5	5 -6	AP	PEN	24	23	21	19	16	11	6.9	4.5
		6 -5		DC	6	6	6	5	5	4	3	2
	Cap 40	7 -4										
	AW 1.5	8 -3										
	Mag	9 -2		MA	.2	.4	.8	1	2	4	6	8
	KD 4	10 -1		BA	61	52	44	36	31	22	16	12
Squad Automatic Weapon version of the AK 74 rifle.	SAB 2	11 0		TOF	0	0	1	1	2	4	7	10

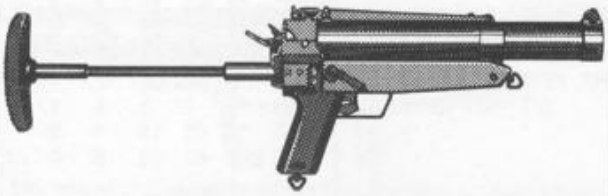
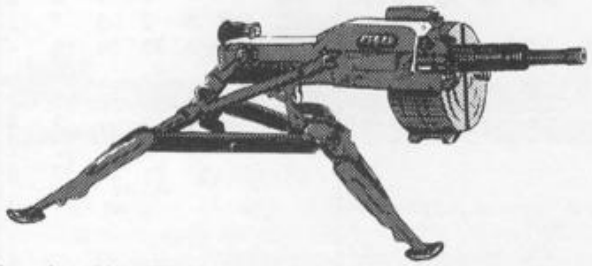
Machine Guns / Tech Level 13

Machine Guns	Physical Data		Aim Time AC	Aim Time Md	Ballistic Data		10	20	40	70	100	200	300	400
RPK / 7.62 x 39mm / Squad Automatic Weapon / USSR	L	41	1	-26	FMJ	PEN	12	11	10	9.1	7.9	5.1	3.3	2.1
	W	15.7	2	-16		DC	7	7	7	6	6	5	3	2
			3	-10	JHP	PEN	11	11	10	8.7	7.6	4.9	3.2	2.1
	RT	10	4	-8		DC	8	8	8	8	8	7	5	3
	ROF	*6	5	-7	AP	PEN	17	16	15	13	11	7.2	4.7	3.0
			6	-5		DC	7	7	6	6	6	5	3	2
	Cap	75	7	-4										
	AW	4.6	8	-3										
		Drm	9	-2		MA	.3	.5	1	2	3	5	8	10
	KD	7	10	-1		BA	58	50	41	33	28	18	13	9
This SAW has replaced the RPD in the Soviet arsenal.	SAB	3	12	0		TOF	0	1	1	2	3	6	10	14
RP 46 / 7.62 x 54mm / Light Machine Gun / USSR	L	51	1	-32	FMJ	PEN	23	23	22	20	18	14	11	8.1
	W	43.0	2	-22		DC	8	8	8	8	8	7	7	6
			3	-17	JHP	PEN	22	22	21	19	18	13	10	7.7
	RT	12	4	-11		DC	10	10	9	9	9	9	8	8
	ROF	*5	5	-9	AP	PEN	33	32	30	28	26	20	15	11
			6	-7		DC	8	8	8	8	7	7	6	6
	Cap	250	7	-6										
	AW	14.3	8	-5										
		Blt	9	-4		MA	.3	.5	1	2	3	5	8	10
	KD	12	11	-2		BA	63	56	48	41	36	27	21	17
Developed in 1946, it is still in service in the third world.	SAB	3	13	0		TOF	0	0	1	2	2	5	8	11
RPD / 7.62 x 39mm / Light Machine Gun / USSR	L	41	1	-28	FMJ	PEN	11	10	9.4	8.2	7.2	4.6	3.0	1.9
	W	22.0	2	-18		DC	7	7	6	6	6	5	3	2
			3	-11	JHP	PEN	10	9.9	9.0	7.9	6.9	4.4	2.8	1.8
	RT	14	4	-9		DC	8	8	8	8	7	6	5	3
	ROF	*6	5	-7	AP	PEN	15	14	13	12	10	6.5	4.2	2.7
			6	-6		DC	6	6	6	6	6	4	3	2
	Cap	100	7	-5										
	AW	5.3	8	-4										
		Drm	9	-3		MA	.2	.5	.9	2	2	5	7	9
	KD	7	10	-2		BA	58	50	40	33	28	18	13	9
Obsolete in the Soviet army, it is still found in Africa and Asia.	SAB	2	12	0		TOF	0	1	1	2	3	6	10	15
PKM / 7.62 x 54mm / Light Machine Gun / USSR	L	46	1	-29	FMJ	PEN	23	22	21	19	18	13	10	7.7
	W	25.5	2	-19		DC	8	8	8	8	8	7	7	6
			3	-12	JHP	PEN	22	21	20	18	17	13	9.7	7.4
	RT	12	4	-9		DC	10	9	9	9	9	9	8	8
	ROF	*6	5	-7	AP	PEN	32	31	29	27	25	19	14	11
			6	-6		DC	8	8	8	8	7	7	6	6
	Cap	100	7	-5										
	AW	5.7	8	-4										
		Blt	9	-3		MA	.4	.8	2	3	4	8	12	16
	KD	12	10	-2		BA	63	56	48	41	36	27	21	17
Standard LMG in the Soviet army. It has replaced the RP 46.	SAB	4	12	0		TOF	0	0	1	2	2	5	8	11
NSV / 12.7 x 107mm / Heavy Machine Gun / USSR	L	61	1	-33	FMJ	PEN	45	44	43	40	38	32	27	23
	W	116.0	2	-23		DC	10	10	10	10	10	10	10	10
			3	-16	JHP	PEN	43	42	41	39	37	31	26	22
	RT	14	4	-12		DC	10	10	10	10	10	10	10	10
	ROF	*6	5	-8	AP	PEN	63	62	60	57	54	45	38	32
			6	-6		DC	10	10	10	10	10	10	10	10
	Cap	50	7	-4										
The NSV was developed in 1969 and is found in all Soviet and Warsaw Pact armies. It is used as a heavy ground support, air defense, and tank air defense weapon. In the ground role it is mounted on a tripod and fitted with a shoulder stock, pistol grip, and optical sight (not shown).	AW	17.0	8	-2										
		Blt	10	0		MA	.3	.5	1	2	3	5	8	10
	KD	49	12	1		BA	64	57	49	43	38	29	23	19
	SAB	3	16	4		TOF	0	0	1	2	2	5	7	10
Enfield LSW / 5.56mm NATO / Squad Automatic Weapon / UK	L	35	1	-26	FMJ	PEN	16	15	14	12	10	6.6	4.2	2.7
	W	15.2	2	-16		DC	6	6	6	6	5	4	3	2
			3	-9	JHP	PEN	15	14	13	11	10	6.3	4.0	2.6
	RT	10	4	-7		DC	8	8	8	7	7	6	4	3
	ROF	*6	5	-6	AP	PEN	22	21	19	17	15	9.3	5.9	3.8
			6	-4		DC	6	6	6	5	5	4	3	2
	Cap	30	7	-3										
	AW	1.0	8	-2										
		Mag	9	-1		MA	.2	.4	.7	1	2	4	6	7
	KD	4	10	0		BA	60	51	42	35	30	20	15	11
Squad Automatic Weapon variant of the Enfield IW rifle.	SAB	2	12	2		TOF	0	0	1	1	2	5	8	11

Machine Guns	Physical Data		Aim Time AC	Aim Time Md	Ballistic Data		Range in 2 yard hexes 10	20	40	70	100	200	300	400
Bren L4 / 7.62mm NATO / Light Machine Gun / UK	L	45	1	-28	FMJ	PEN	18	18	17	15	14	9.8	7.0	5.0
	W	23.6	2	-19		DC	8	8	8	7	7	6	6	5
			3	-12	JHP	PEN	18	17	16	15	13	9.4	6.7	4.8
	RT	8	4	-9		DC	9	9	9	9	9	8	7	7
	ROF	*4	5	-7	AP	PEN	26	25	24	21	19	14	9.9	7.1
			6	-6		DC	8	7	7	7	7	6	6	5
	Cap	30	7	-5										
	AW	2.6	8	-4										
		Mag	9	-3		MA	.2	.4	.8	1	2	4	6	8
	KD	10	11	-1		BA	61	53	45	37	32	23	17	13
L4 series Bren gun in 7.62mm NATO. Used by all British forces.	SAB	3	13	1		TOF	0	0	1	2	2	5	8	12
L7A2 / 7.62mm NATO / General Purpose Machine Gun / UK	L	49	1	-31	FMJ	PEN	19	19	17	16	14	10	7.3	5.3
	W	32.8	2	-21		DC	8	8	8	7	7	7	6	5
			3	-15	JHP	PEN	18	18	17	15	14	9.8	7.0	5.1
	RT	12	4	-10		DC	9	9	9	9	9	8	7	7
	ROF	*7	5	-8	AP	PEN	27	26	24	22	20	14	10	7.4
			6	-7		DC	8	8	7	7	7	6	6	5
	Cap	100	7	-5										
	AW	6.5	8	-4										
		Blt	10	-3		MA	.3	.6	1	2	3	6	10	13
	KD	10	12	-1		BA	61	53	45	37	32	23	17	13
Based on the FN MAG, the L7A2 is the standard GPMG of the British army.	SAB	3	15	1		TOF	0	0	1	2	2	5	8	12
M249 Minimi / 5.56mm NATO / Squad Automatic Weapon / USA	L	41	1	-28	FMJ	PEN	15	15	14	12	11	7.0	4.6	3.0
	W	22.0	2	-18		DC	6	6	6	6	5	4	3	2
			3	-11	JHP	PEN	15	14	13	12	10	6.7	4.4	2.9
	RT	14	4	-9		DC	8	8	7	7	7	6	5	3
	ROF	*7	5	-7	AP	PEN	22	21	19	17	15	9.9	6.5	4.3
			6	-6		DC	6	6	6	5	5	4	3	2
	Cap	200	7	-4										
	AW	6.9	8	-3										
		Blt	9	-2		MA	.2	.3	.7	1	2	3	5	7
	KD	4	10	-1		BA	61	53	44	37	32	22	17	13
Belgium designed Squad Automatic Weapon adopted by the US army.	SAB	2	12	0		TOF	0	0	1	2	2	5	8	11
M60 / 7.62mm NATO / General Purpose Machine Gun / USA	L	44	1	-30	FMJ	PEN	20	19	18	16	15	11	7.7	5.5
	W	29.7	2	-20		DC	8	8	8	7	7	7	6	5
			3	-14	JHP	PEN	19	19	17	16	14	10	7.4	5.3
	RT	12	4	-10		DC	9	9	9	9	9	8	8	7
	ROF	*5	5	-8	AP	PEN	28	27	25	23	21	15	11	7.8
			6	-6		DC	8	8	7	7	7	6	6	5
	Cap	100	7	-5										
	AW	6.5	8	-4										
		Blt	9	-3		MA	.3	.5	1	2	3	5	8	10
	KD	10	10	-2		BA	61	53	45	37	32	23	17	13
Adopted in the 1950s, this is the standard GPMG of US forces.	SAB	3	12	0		TOF	0	0	1	2	2	5	8	11
M60E3 / 7.62mm NATO / General Purpose Machine Gun / USA	L	42	1	-29	FMJ	PEN	20	20	18	17	15	11	7.8	5.6
	W	25.5	2	-19		DC	8	8	8	7	7	7	6	5
			3	-12	JHP	PEN	19	19	18	16	14	10	7.5	5.4
	RT	12	4	-9		DC	9	9	9	9	9	8	8	7
	ROF	*5	5	-7	AP	PEN	28	28	26	23	21	15	11	7.9
			6	-6		DC	8	8	8	7	7	6	6	5
	Cap	100	7	-5										
	AW	6.5	8	-4										
		Blt	9	-3		MA	.3	.6	1	2	3	6	9	12
	KD	10	10	-2		BA	61	53	45	37	33	23	17	13
Light version of the M60 adopted by the US Navy and Marine Corps.	SAB	4	12	0		TOF	0	0	1	2	2	5	8	11
M2HB / .50 Browning / Heavy Machine Gun / USA	L	65	1	-37	FMJ	PEN	40	39	37	35	34	28	23	19
	W	157.5	2	-27		DC	10	10	10	10	10	10	10	10
			3	-21	JHP	PEN	38	37	36	34	32	27	22	19
	RT	14	4	-17		DC	10	10	10	10	10	10	10	10
	ROF	*5	5	-14	AP	PEN	56	55	53	50	47	39	33	27
			6	-10		DC	10	10	10	10	10	10	10	10
	Cap	105	7	-8										
	AW	28.8	8	-6										
		Blt	10	-4		MA	.2	.3	.6	1	2	3	5	6
	KD	45	12	-2		BA	64	57	49	42	37	28	22	19
Standard US Heavy Machine Gun in service since 1933.	SAB	2	14	0		TOF	0	0	1	2	2	5	8	11

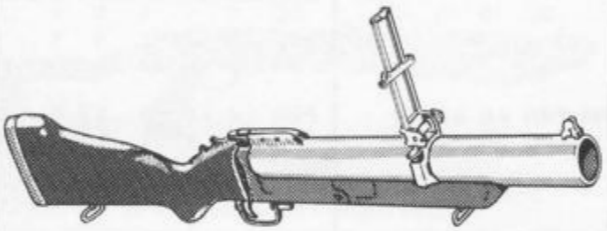
Shotguns / Tech Level 13

Shotguns	Physical Data	Aim Time AC Md	Ballistic Data		Target Range in 2 Yard Hexes 1	2	4	6	8	10	15	20	30	40	80
Franchi SPAS 12 / 12 Gauge Shotgun / Italy	L 28/37	1 -23	APS	PEN	21	21	21	21	21	21	21	20	20	19	18
	W 10.1	2 -13		DC	9	9	9	9	9	9	9	9	9	9	8
		3 -9													
	RT 30	4 -7	Shot	PEN	5.3	1.6	1.5	1.5	1.4	1.4	1.3	1.2	1.1	.9	.5
	ROF *	5 -6	(00)	DC	8	3	3	3	3	3	2	2	2	2	1
		6 -4		SALM	-13	-8	-3	0	2	4	7	9	12	14	19
	Cap 7	7 -3	12	BPHC		*11	*10	*9	*5	*4	*2	94	42	24	5
	AW .13	8 -2		PR	.0	.0	.0	.1	.1	.1	.2	.2	.3	.4	.9
	Rnd	9 -1													
Special Purpose Automatic Shotgun for police and military. The APS entry is for a special Armor Piercing Slug.	KD 23			BA	71	61	52	46	42	39	33	29	23	19	9
	SAB 10			TOF	0	0	0	0	0	0	1	1	1	2	4
Olin - Heckler & Koch CAWS / 12 Gauge Shotgun / USA	L 30	1 -24	Slug	PEN	7.0	7.0	6.9	6.9	6.8	6.7	6.6	6.5	6.3	6.0	5.2
	W 11.6	2 -14		DC	10	10	10	10	10	10	9	9	9	9	8
		3 -9													
	RT 8	4 -7	Shot	PEN	5.6	2.4	2.4	2.3	2.3	2.2	2.1	2.0	1.7	1.5	.9
	ROF *	5 -5	(000)	DC	8	4	4	4	4	4	3	3	3	3	2
		6 -4		SALM	-13	-8	-3	0	2	4	7	9	11	14	19
	Cap 10	7 -3	8	BPHC		*7	*7	*6	*4	*2	*1	66	30	16	3
	AW 2.1	8 -2		PR	.0	.0	.0	.1	.1	.1	.2	.2	.3	.4	.9
	Mag	9 -1													
	KD 23	10 0		BA	67	58	48	42	38	35	29	25	19	15	5
Close Assault Weapon System uses a belted brass cartridge.	SAB 10	12 2		TOF	0	0	0	0	0	0	1	1	1	2	4
Mossberg Bullpup 12 / 12 Gauge Shotgun / USA	L 31	1 -23	Slug	PEN	7.5	7.4	7.4	7.3	7.3	7.2	7.1	7.0	6.7	6.5	5.6
	W 9.4	2 -12		DC	10	10	10	10	10	10	10	10	9	9	9
		3 -9													
	RT 34	4 -7	Shot	PEN	5.4	1.7	1.6	1.6	1.6	1.5	1.4	1.3	1.1	1.0	.6
	ROF 2	5 -6	(00)	DC	8	3	3	3	3	3	2	2	2	2	1
		6 -5		SALM	-14	-9	-4	-1	1	2	5	7	10	12	17
	Cap 8	7 -4	12	BPHC		*11	*10	*9	*7	*5	*2	*1	62	35	8
	AW .13	8 -3		PR	.0	.0	.0	.1	.1	.1	.1	.2	.3	.4	.7
	Rnd	9 -2													
Mossberg 500 action in a military style stock. This weapon is designed for military and law enforcement use.	KD 24	10 -1		BA	67	58	48	42	38	35	29	25	19	15	5
	SAB 11			TOF	0	0	0	0	0	0	1	1	1	2	4
Remington M870 / 12 Gauge Shotgun / USA	L 42	1 -23	Slug	PEN	7.7	7.7	7.6	7.5	7.5	7.4	7.3	7.2	6.9	6.7	5.7
	W 8.8	2 -12		DC	10	10	10	10	10	10	10	10	10	9	9
		3 -9													
	RT 30	4 -7	Shot	PEN	5.4	1.7	1.7	1.6	1.6	1.6	1.4	1.4	1.2	1.0	.6
	ROF 2	5 -6	(00)	DC	8	3	3	3	3	3	2	2	2	2	1
		6 -4		SALM	-14	-9	-4	-1	1	2	5	7	10	12	17
	Cap 7	7 -3	12	BPHC		*11	*10	*9	*7	*5	*2	*1	62	35	8
	AW .13	8 -2		PR	.0	.0	.0	.1	.1	.1	.1	.2	.3	.4	.7
	Rnd														
US Marine Corps version of the Remington Model 870. It was adopted in 1966 and has a standard M7 bayonet mounting lug.	KD 25			BA	67	58	48	42	38	35	29	25	19	15	5
	SAB 12			TOF	0	0	0	0	0	0	1	1	1	2	4
High Standard M10B / 12 Gauge Shotgun / USA	L 27	1 -23	Slug	PEN	7.0	7.0	6.9	6.9	6.8	6.7	6.6	6.5	6.3	6.0	5.2
	W 9.5	2 -12		DC	10	10	10	10	10	10	9	9	9	9	8
		3 -9													
	RT 22	4 -7	Shot	PEN	5.3	1.6	1.5	1.5	1.4	1.4	1.3	1.2	1.1	.9	.5
	ROF *	5 -6	(00)	DC	8	3	3	2	2	2	2	2	2	2	1
		6 -4		SALM	-13	-8	-3	0	2	4	7	9	12	14	19
	Cap 5	7 -3	12	BPHC		*11	*10	*9	*5	*3	*2	93	42	23	5
	AW .13	8 -2		PR	.0	.0	.0	.1	.1	.1	.2	.2	.3	.4	.9
	Rnd														
	KD 23			BA	67	58	48	42	38	35	29	25	19	15	5
Compact shotgun for police tactical teams.	SAB 10			TOF	0	0	0	0	0	0	1	1	1	2	4
Atchisson Assault 12 / 12 Gauge Shotgun / USA	L 39	1 -26	Slug	PEN	7.0	7.0	6.9	6.9	6.8	6.7	6.6	6.5	6.3	6.0	5.2
	W 16.1	2 -16		DC	10	10	10	10	10	10	9	9	9	9	8
		3 -10													
	RT 14	4 -8	Shot	PEN	5.4	1.6	1.5	1.5	1.4	1.4	1.3	1.2	1.1	.9	.5
	ROF *4	5 -7	(00)	DC	8	3	3	2	2	2	2	2	2	2	1
		6 -5		SALM	-13	-8	-3	0	2	4	7	9	12	14	19
	Cap 20	7 -4	12	BPHC		*11	*10	*9	*5	*3	*2	93	42	23	5
	AW 4.6	8 -3		PR	.0	.0	.0	.1	.1	.1	.2	.2	.3	.4	.9
	Drm	9 -2													
Fully automatic, high capacity, drum fed shotgun. Very few were produced and it has not been adopted by any military.	KD 23	10 -1		MA	.1	.2	.3	.5	.7	.8	1	2	2	3	7
	SAB 8	12 0		TOF	0	0	0	0	0	0	1	1	1	2	4

Explosive Weapons	Physical Data	Aim Time AC Md	Ballistic Data Target Range 40 100 200 400	Explosive Data Burst Range in Hexes 0 1 2 3 5 10
H & K 69A1 / 40mm Grenade Launcher / W Germany  Compact grenade launcher with folding stock. The weapon is of single shot, break-action design very similar to the US M79.	L 18/27 W 4.1 RT 10 ROF - Cap 1 AW .51 Rnd MR 200 SAB 11	1 -19 2 -10 3 -8 4 -6 5 -5 6 -4 7 -3	HEAT PEN 288 288 288 DC 10 10 10 HE PEN 2.0 2.0 2.0 DC 10 10 10 AOI 1 4 BA 23 10 1 TOF 11 33 80	PEN 1.6 1.4 1.0 .7 .4 DC 1 1 1 1 1 BSHC *2 47 11 4 1 BC 241 71 23 12 5 1 PEN 1.4 1.2 .8 .6 .3 DC 1 1 1 1 1 BSHC *3 73 17 7 2 BC 250 74 23 12 5 1
H & K 79 / 40mm Grenade Launcher / W Germany This grenade launcher fits on all G3 or G41 rifles except the short K models. The barrel drops down for loading.	L 40 W 14.9 RT 12 ROF - Cap 1 AW .51 Rnd MR 200 SAB 7	1 -26 2 -16 3 -10 4 -7 5 -6 6 -4	HEAT PEN 288 288 288 DC 10 10 10 HE PEN 2.0 2.0 2.0 DC 10 10 10 AOI 1 4 BA 23 10 1 TOF 11 33 80	PEN 1.6 1.4 1.0 .7 .4 DC 1 1 1 1 1 BSHC *2 47 11 4 1 BC 241 71 23 12 5 1 PEN 1.4 1.2 .8 .6 .3 DC 1 1 1 1 1 BSHC *3 73 17 7 2 BC 250 74 23 12 5 1
Armscor 6 / 40mm Grenade Launcher / South Africa Six shot semi-automatic grenade launcher using a revolver type feed. Provided with collimating sight and artificial boresight.	L 22/31 W 15.0 RT 24 ROF * Cap 6 AW .51 Rnd MR 200 SAB 7	1 -26 2 -16 3 -10 4 -8 5 -6 6 -5 7 -3	HEAT PEN 288 288 288 DC 10 10 10 HE PEN 2.0 2.0 2.0 DC 10 10 10 AOI 1 4 BA 23 10 1 TOF 11 33 80	PEN 1.6 1.4 1.0 .7 .4 DC 1 1 1 1 1 BSHC *2 47 11 4 1 BC 241 71 23 12 5 1 PEN 1.6 1.4 1.0 .7 .4 DC 1 1 1 1 1 BSHC *3 62 15 6 2 BC 273 80 25 13 6 1
AK 74 with 30mm Grenade Launcher / USSR AK 74 rifle with 30mm grenade launcher. This launcher's function is similar to the US M203.	L 37 W 10.1 RT 12 ROF - Cap 1 AW .56 Rnd MR 200 SAB 8	1 -23 2 -13 3 -9 4 -7 5 -5	HE PEN 2.5 2.5 2.5 DC 10 10 10 AOI 1 4 BA 23 5 -4 TOF 11 35 81	PEN 2.4 2.2 1.8 1.5 1.0 .4 DC 2 2 2 2 1 1 BSHC *2 58 14 6 1 -2 BC 250 74 23 12 5 1
AGS-17 Plamya / 30mm Grenade Launcher / USSR  Introduced in 1975 as a company level support weapon.	L 33 W 140.5 RT 12 ROF *1 Cap 29 AW 24.0 Drm MR 950 SAB 1	1 -38 2 -28 3 -22 4 -18 5 -15 6 -10 7 -8 8 -6 9 -5 10 -4 11 -3 12 -2 13 -1	HE PEN 2.5 2.5 2.5 2.5 DC 10 10 10 10 AOI 1 MA .2 .4 .8 2 BA 32 19 9 0 TOF 4 11 24 57	PEN 2.4 2.2 1.8 1.5 1.0 .4 DC 2 2 2 2 1 1 BSHC *2 58 14 6 1 -2 BC 250 74 23 12 5 1

Explosive Weapons / Tech Level 13

M79 / 40mm Grenade Launcher / USA



Accurate breech loading grenade launcher which has been replaced by the M203.

Physical Data		Aim Time AC	Aim Time Md
L	29	1	-21
W	6.5	2	-11
		3	-8
RT	10	4	-7
ROF	-	5	-5
		6	-4
Cap	1	7	-3
AW	.51 Rnd		
MR	200		
SAB	11		

Ballistic Data		Target Range 40	100	200	400
HEAT	PEN	288	288	288	
	DC	10	10	10	
HE	PEN	2.1	2.1	2.1	
	DC	10	10	10	
AOI			1	4	
BA		23	10	1	
TOF		11	33	80	

Explosive Data	Burst Range in Hexes 0	1	2	3	5	10
PEN	1.6	1.4	1.0	.7	.4	
DC	1	1	1	1	1	
BSHC	*2	47	11	4	1	
BC	241	71	23	12	5	1
PEN	1.6	1.4	1.0	.7	.4	
DC	1	1	1	1	1	
BSHC	*3	62	15	6	2	
BC	273	80	25	13	6	1

M203 / M16 with 40mm Grenade Launcher / USA

Slide action breech loading grenade launcher fitted to an M16 rifle. This weapon replaced the M79 in 1970.

Physical Data		Aim Time AC	Aim Time Md
L	39	1	-24
W	11.6	2	-14
		3	-9
RT	12	4	-7
ROF	-	5	-6
		6	-4
Cap	1		
AW	.51 Rnd		
MR	200		
SAB	8		

Ballistic Data		Target Range 40	100	200	400
HEAT	PEN	288	288	288	
	DC	10	10	10	
HE	PEN	2.1	2.1	2.1	
	DC	10	10	10	
AOI			1	4	
BA		23	10	1	
TOF		11	33	80	

Explosive Data	Burst Range in Hexes 0	1	2	3	5	10
PEN	1.6	1.4	1.0	.7	.4	
DC	1	1	1	1	1	
BSHC	*2	47	11	4	1	
BC	241	71	23	12	5	1
PEN	1.6	1.4	1.0	.7	.4	
DC	1	1	1	1	1	
BSHC	*3	62	15	6	2	
BC	273	80	25	13	6	1

M174 / 40mm Grenade Launcher / USA

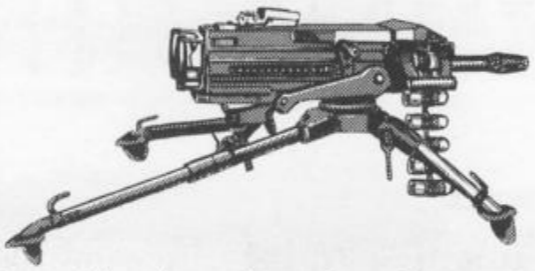
Automatic grenade launcher firing standard 40mm grenades.

Physical Data		Aim Time AC	Aim Time Md
L	28	1	-32
W	40.8	2	-22
		3	-16
RT	14	4	-11
ROF	*3	5	-8
		6	-7
Cap	12	7	-5
AW	9.9 Drm	8	-4
		9	-3
		10	-2
MR	200	11	-1
SAB	4		

Ballistic Data		Target Range 40	100	200	400
HEAT	PEN	288	288	288	
	DC	10	10	10	
HE	PEN	2.1	2.1	2.1	
	DC	10	10	10	
AOI			1	4	
MA		.7	2	4	
BA		23	10	1	
TOF		11	33	80	

Explosive Data	Burst Range in Hexes 0	1	2	3	5	10
PEN	1.6	1.4	1.0	.7	.4	
DC	1	1	1	1	1	
BSHC	*2	47	11	4	1	
BC	241	71	23	12	5	1
PEN	1.6	1.4	1.0	.7	.4	
DC	1	1	1	1	1	
BSHC	*3	62	15	6	2	
BC	273	80	25	13	6	1

M19 / 40mm Grenade Launcher / USA



This grenade launcher uses its own longer 40mm grenades.

Physical Data		Aim Time AC	Aim Time Md
L	41	1	-40
W	137.2	2	-30
		3	-25
RT	14	4	-21
ROF	*3	5	-17
		6	-15
Cap	50	7	-10
AW	45.2 Blt	8	-8
		9	-6
		10	-5
MR	900	11	-3
SAB	4		

Ballistic Data		Target Range 40	100	200	400
HEAT	PEN	288	288	288	288
	DC	10	10	10	10
HE	PEN	2.6	2.6	2.6	2.6
	DC	10	10	10	10
AOI					1
MA		.8	2	4	8
BA		27	14	5	-4
TOF		3	9	21	52

Explosive Data	Burst Range in Hexes 0	1	2	3	5	10
PEN	1.6	1.4	1.0	.7	.4	
DC	1	1	1	1	1	
BSHC	*2	47	11	4	1	
BC	241	71	23	12	5	1
PEN	2.5	2.4	2.2	2.0	1.6	1.0
DC	3	3	3	3	2	1
BSHC	6	1	-3	-6	-9	-15
BC	353	100	31	16	7	2

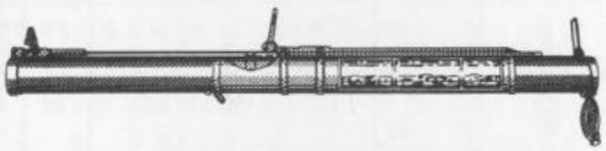
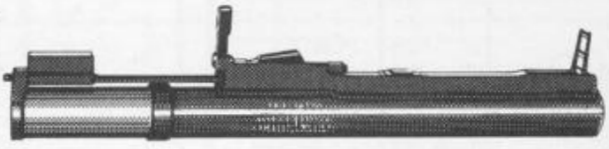
PZF 44 2A1 Lanze / 66mm RPG / W Germany

Reloadable Rocket Propelled Grenade (RPG) launcher similar to the Soviet RPG 7V.

Physical Data		Aim Time AC	Aim Time Md
L	35/46	1	-28
W	22.7	2	-18
		3	-11
RT	28	4	-9
ROF	-	5	-7
		6	-6
Cap	1	7	-4
AW	5.5 Rnd	8	-3
		9	-2
		10	-1
MR	850		

Ballistic Data		Target Range 40	100	200	400
HEAT	PEN	89h	89h	89h	89h
	DC	10	10	10	10
HE	PEN	6.1	6.1	6.1	6.1
	DC	10	10	10	10
AOI					1
BA		14	2	-7	-17
TOF		4	9	20	45

Explosive Data	Burst Range in Hexes 0	1	2	3	5	10
PEN	5.2	5.1	4.8	4.6	4.2	3.4
DC	7	7	7	7	6	6
BSHC	15	3	0	-3	-7	-12
BC	11h	252	72	36	16	5
PEN	6.0	5.9	5.6	5.4	4.9	3.9
DC	7	7	7	7	7	6
BSHC	15	3	0	-3	-7	-12
BC	13h	287	81	40	17	6

Explosive Weapons	Physical Data	Aim Time AC Md	Ballistic Data Target Range 40 100 200 400	Explosive Data Burst Range in Hexes 0 1 2 3 5 10
Armbrust / 67mm Anti-Tank Rocket / W Germany	L 34 W 16.0 RT 14 ROF - Cap 1 MR 850	1 -26 2 -16 3 -10 4 -8 5 -6 6 -5 7 -4 8 -3 9 -2 10 -1	HEAT PEN 66h 66h 66h 66h DC 10 10 10 10 AOI 1 BA 12 -1 -10 -20 TOF 4 10 21 50	PEN 5.2 5.1 4.8 4.6 4.2 3.4 DC 7 7 7 7 6 6 BSHC 15 3 0 -3 -7 -12 BC 11h 252 72 36 16 5 PEN 1.4 1.2 .8 .6 .3 DC 1 1 1 1 1 BSHC *6 *2 38 16 5 BC 11h 252 72 36 16 5
 This one-shot disposable rocket launcher uses a counter mass to eliminate back flash & blast. The launch explosive is contained in the tube. Plastic flakes are driven out the back of the tube for the recoilless effect.				
RPG 18 / 64mm Anti-Tank Rocket Launcher / USSR	L 28/39 W 14.3 RT 20 ROF - Cap 1 MR 600	1 -25 2 -15 3 -10 4 -8 5 -6 6 -5 7 -4 8 -2	HEAT PEN 59h 59h 59h 59h DC 10 10 10 10 AOI 1 2 BA 16 5 -5 -14 TOF 7 17 36 78	PEN 4.8 4.7 4.5 4.3 3.9 3.1 DC 7 7 6 6 6 5 BSHC 15 3 0 -3 -6 -12 BC 10h 232 67 34 15 5
 This disposable rocket launcher is similar to the US M72 LAW. It has pop up sights and must be extended before firing. The rocket motor completes its burn while still in the launch tube and it fires a 64mm shaped charge warhead.				
RPG 7V / 85mm Rocket Propelled Grenade / USSR	L 39/54 W 20.4 RT 15 ROF - Cap 1 AW 5.0 Rnd MR 500	1 -28 2 -18 3 -11 4 -9 5 -7 6 -6 7 -5 8 -4 9 -3 10 -2 11 -1 12 0	HEAT PEN 72h 72h 72h 72h DC 10 10 10 10 AOI BA 15 4 -6 -15 TOF 2 6 14 30	PEN 7.2 7.1 6.9 6.7 6.2 5.2 DC 8 8 8 8 8 7 BSHC 11 2 -1 -4 -8 -13 BC 20h 393 105 52 22 7 PEN 8.1 8.0 7.7 7.5 7.0 5.9 DC 9 9 9 8 8 8 BSHC 11 2 -1 -4 -8 -13 BC 24h 441 115 57 24 8
 The RPG 7 is the standard man portable short range anti-tank weapon of the Soviet army and Warsaw Pact. The Reload Time assumes the rocket already has its propellant charge screwed into the warhead.				
LAW 80 / 94mm Anti-Tank Rocket / UK	L 39/59 W 21.2 RT 20 ROF - Cap 1 MR 600	1 -28 2 -18 3 -11 4 -9 5 -7 6 -5 7 -4 8 -3 9 -2 10 -1	HEAT PEN 17k 17k 17k 17k DC 10 10 10 10 AOI 1 2 BA 8 -4 -14 -23 TOF 5 15 35 85	PEN 8.3 8.2 8.0 7.7 7.3 6.2 DC 9 9 9 9 9 8 BSHC 10 2 -1 -4 -8 -13 BC 26h 480 123 60 26 9
 One shot disposable short range anti-tank weapon which uses a built-in low velocity 9mm spotting rifle. The spotting rifle has a 5 round capacity. The bullets have a tracer and flash warhead for recording a hit on target, thus determining its range.				
M72 A2 LAW / 66mm Light Anti-Tank Weapon / USA	L 26/35 W 5.2 RT 14 ROF - Cap 1 MR 650	1 -20 2 -11 3 -8 4 -6 5 -5 6 -4 7 -3 8 -2	HEAT PEN 68h 68h 68h 68h DC 10 10 10 10 AOI 1 1 BA 11 -1 -11 -20 TOF 5 14 32 75	PEN 5.0 4.9 4.7 4.5 4.1 3.3 DC 7 7 7 7 6 5 BSHC 15 3 0 -3 -7 -12 BC 11h 245 70 36 15 5
 This man portable, one shot, disposable rocket launcher is a standard short range anti-tank weapon in the US and NATO armies. The Reload Time includes the time to extend the launch tube and deploy the sights.				

Grenades and Explosives / Tech Level 13

Grenade/Explosive	Physical Data	Explosion Data Range From Burst in Hexes C	0	1	2	3	5	10
HG 78 Frag Grenade Austria	L 4.5 W 1.2 AT 3 FL 2 R 14	PEN 2.6 DC 10 BSHC *2k BC 60h	1.4 1 *23 414	1.2 1 *6 114	.8 1 *1 35	.6 1 64 18	.3 1 22 8	3
OF HG 78 Blast Grenade Austria	L 4.5 W .5 AT 3 FL 2 R 21	PEN 2.6 DC 10 BC 60h	414	114	35	18	8	3
HG 80 Mini Grenade Austria	L 3.0 W .4 AT 3 FL 2 R 25	PEN 1.6 DC 10 BSHC *3h BC 14h	1.4 1 *4 158	1.2 1 *1 49	.8 1 25 16	.6 1 11 8	.3 1 3 4	1
NR 423 Frag Grenade Belgium	L 3.2 W .5 AT 3 FL 2 R 21	PEN 2.5 DC 10 BSHC *3h BC 52h	1.8 2 *4 376	1.6 2 94 105	1.2 1 23 33	1.0 1 10 17	.6 1 3 7	2
NR 446 Blast Grenade Belgium	L 3.2 W .6 AT 3 FL 2 R 20	PEN 2.8 DC 10 BC 73h	468	126	39	20	9	3
Type 59 Frag Grenade China	L 4.5 W .7 AT 3 FL 2 R 18	PEN 3.1 DC 10 BSHC *2h BC 94h	2.9 3 *3 554	2.7 3 69 145	2.3 2 16 44	2.0 2 7 22	1.4 2 2 10	.7 1 -1 3
Type 82 Frag Grenade China	L 3.3 W .6 AT 5 FL 2 R 20	PEN 3.3 DC 10 BSHC *90 BC 53h	3.2 3 *1 383	2.9 3 31 107	2.5 3 7 33	2.2 2 3 17	1.6 2 0 7	.8 1 -4 2
DF 37 Frag Grenade France	L 3.9 W 1.2 AT 3 FL 2 R 14	PEN 2.4 DC 10 BSHC *30 BC 49h	1.9 3 41 360	1.9 3 10 101	1.7 3 2 32	1.6 3 0 16	1.4 3 -3 7	1.0 2 -8 2
OF 37 Blast Grenade France	L 3.7 W .3 AT 3 FL 2 R 27	PEN 2.8 DC 10 BC 77h	485	130	40	20	9	3
MDN 21 Frag Grenade W Germany	L 3.3 W .5 AT 3 FL 2 R 21	PEN 2.2 DC 10 BSHC *7h BC 40h	1.4 1 *9 316	1.2 1 *2 91	.8 1 57 28	.6 1 25 15	.3 1 8 6	2
DM 51 Frag Grenade W Germany	L 3.9 W 1.0 AT 3 FL 2 R 15	PEN 2.7 DC 10 BSHC *2k BC 69h	1.4 1 *27 453	1.1 1 *7 123	.8 1 *2 38	.5 1 75 19	8	3
M26 A2 Frag Grenade Israel	L 4.2 W .9 AT 3 FL 2 R 15	PEN 3.3 DC 10 BSHC *3h BC 13k	2.4 2 *4 684	2.2 2 *1 171	1.8 2 25 51	1.5 2 11 26	1.0 1 3 11	.4 1 0 4

Grenade/Explosive	Physical Data	Explosion Data Range From Burst in Hexes C	0	1	2	3	5	10
# 14 Blast Grenade Israel	L 5.3 W .7 AT 3 FL 2 R 18	PEN 3.7 DC 10 BC 17k	840	202	59	30	13	4
MU 50 Frag Grenade Italy	L 2.8 W .4 AT 3 FL 2 R 23	PEN 2.2 DC 10 BSHC *4h BC 36h	1.4 1 *6 295	1.2 1 *1 85	.8 1 36 27	.6 1 15 14	.3 1 5 6	2
RGD 5 Frag Grenade USSR	L 4.5 W .7 AT 3 FL 2 R 18	PEN 3.1 DC 10 BSHC *2h BC 94h	2.9 3 *3 554	2.7 3 69 145	2.3 2 16 44	2.0 2 7 22	1.4 2 2 10	.7 1 -1 3
RKG 3M Anti-Tank Grenade USSR	L 14.3 W 2.4 AT 3 FL I R 10	PEN 28h DC 10 BSHC *9 BC 54k	10 8 12 19h	9.7 8 2 379	9.2 8 -1 102	8.7 7 -4 50	7.8 7 -7 22	6.0 6 -12 7
L2 A2 Frag Grenade UK	L 3.3 W .9 AT 3 FL 2 R 16	PEN 3.5 DC 10 BSHC *2h BC 15k	2.4 2 *3 747	2.2 2 77 184	1.8 2 19 55	1.5 2 8 28	1.0 1 2 12	.4 1 -1 4
M 67 Frag Grenade USA	L 3.5 W .9 AT 3 FL 2 R 16	PEN 5.0 DC 10 BSHC *23 BC 16k	4.9 6 31 779	4.8 6 7 190	4.5 5 1 56	4.2 5 0 29	3.7 5 -4 12	2.6 4 -9 4
M 68 Frag Grenade USA	L 3.5 W .9 AT 3 FL I R 16	PEN 5.1 DC 10 BSHC *21 BC 16k	5.0 6 28 791	4.8 6 6 192	4.5 5 1 57	4.2 5 -1 29	3.7 5 -4 12	2.7 4 -9 4
M 61 Frag Grenade USA	L 3.8 W 1.0 AT 3 FL 2 R 15	PEN 3.4 DC 10 BSHC *2h BC 13k	2.4 2 *3 704	2.2 2 84 176	1.8 2 20 52	1.5 2 8 27	1.0 1 2 12	.4 1 -1 4
M 26 A2 Frag Grenade USA	L 3.9 W 1.0 AT 3 FL I R 15	PEN 3.4 DC 10 BSHC *3h BC 13k	2.4 2 *4 704	2.2 2 *1 176	1.8 2 25 52	1.5 2 11 27	1.0 1 3 12	.4 1 0 4
Mk A3 Blast Grenade USA	L 5.3 W 1.0 AT 3 FL 2 R 15	PEN 3.8 DC 10 BC 20k	928	218	63	32	14	4
2 lb TNT	L 3.8 W 2.0 AT V FL V R 11	PEN 6.1 DC 10 BC 92k	29h	520	131	64	27	9
10 lb TNT	L 6.5 W 10.0 AT V FL V R 5	PEN 10 DC 10 BC 59t	15k	19h	347	153	61	19

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Find out about the changes from Miss Atomic Bomb and the mods here!

[Phoenix Command] Reverse-engineering table 2A/Odds of Hitting *(1 Viewer)*

LatwPIAT · May 26, 2013 · phoenix command

1 2 3 ... 6 Next ›

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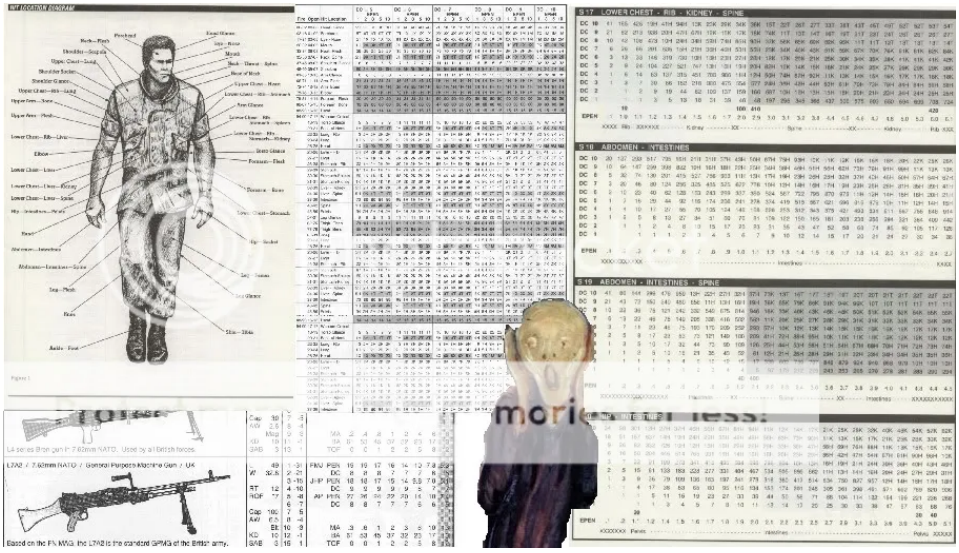
May 26, 2013 #1



(Image by Bobrama)

I mentioned in another thread that I'd reverse-engineered Table 2A/Odds of Hitting from the *Phoenix Command* core rulebook. This was a little prematurely, since I hadn't actually done it - I'd just found part of the equation Barry Nakazono used to make the table. Admittedly the most difficult part of the equation, but I was still only halfway to the full equation. So I spent the morning reverse-engineering the equation in full, and I thought should share it.

A simple plot of any one row or column from Table 2A/Odds of Hitting will have the

characteristic shape of the cumulative distributive function of a normal distribution over $^1/_x$. This tells us that the core function of Table 2A is the Gaussian error function erf(). In general, we can say that the probability of hitting P(to hit) is given by the function

$$P(\text{to hit}) = \text{erf}(f(s,r))$$

Where *s* is the Shot Accuracy and *r* the Target Range In Hexes from Table 2A. The function f is, for the moment, unknown. Conveniently, erf() has an inverse $\text{erf}^{-1}()$, so for any given probability, we can figure out the value of f(*s*,*r*):

$$f(s,r) = \text{erf}^{-1}(P(\text{to hit}))$$

However, plotting f(*s*,*r*) as a function of *s* and *r*, independently, doesn't reveal much about f.

And then I re-read the Advanced Rules. Interestingly, the Advanced Rules don't use Table 2A. Instead, it uses Table 4G, which is a function of just one variable: EAL. EAL is a sum of Shot Accuracy and all the Aim Level Modifiers (ALM) - and range is implemented as an ALM from Table 4A based on the range (in hexes). It seemed rather odd to me that the Advanced Rules would use a single-variable table and that the Basic Rules would use a double-variable table; if anything, a double-variable table allows you to implement more detail through multiple factors, while with a single-variable table, you can only account for one factor.

Unless, of course, Table 2A was just Table 4G plotted in two dimensions instead of one. In mathematical terms, if table 2A was given by the function

$$P(\text{to hit}) = \text{erf}(f(s,r))$$

then table 4G was given by the function

$$P(\text{to hit}) = \text{erf}(g(s+h(r)))$$

It's trivial to show that f(*s*,*r*) = g(*s*+h(*r*)), and I could then g as a function of *s*+h(*r*), with h(*r*) given by Table 4A. I plotted the entire range of Table 4G in Excel, which gave me the following equation:

$$g(x) = 8*10^{-5}*x^3 + 6*10^{-5}*x^2+0.0007*x+0.0127$$

The R^2 value for this equation is 0.9998, so it's *extremely* accurate. I also plotted a range of h(x) from Table 4A, which gave the following equation with an R^2 value of 0.9991:

$$h(x) = -7.064\ln(x)+32.828$$

Hence, the equation used to generate Table 2A can be given as

$$P(\text{to hit}) = \text{erf}(8*10^{-5}*(\text{EAL})^3 + 6*10^{-5}*(\text{EAL})^2+0.0007*(\text{EAL})+0.0127)$$

Where

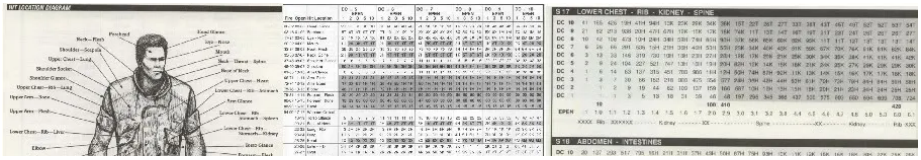
$$\text{EAL} = \text{SAL} + \text{ALM's } -7.064\ln((\text{Range}))+32.828$$

Note that for very small values of Shot Accuracy and Range, these equations and Table 2A

don't match up perfectly; the equations will give a hit probability of ~1%, while Table 2A will declare that shot to be a certain miss. I chose to attribute this to rounding errors that occur when I try to reverse-engineer the equations from values that are rounded.

Asen_G
#3 Anti-Illusionism Squad
Validated User

May 26, 2013 #2

> LatwPIAT said:
>
> 
>
> Click to expand...

It was me who asked for it. Sorry if it gave you work, I had no way to know you'd need to finish the reverse-engineering !

OTOH, thanks to you, someone can actually program this in and Phoenix Command would actually require consulting less tables !

Last edited: May 26, 2013

LatwPIAT
Active member
Validated User

May 26, 2013 #3

> Asen_G said:
>
> It was me who asked for it. Sorry if it gave you work, I had no way to know you'd need to finish the reverse-engineering !
>
> OTOH, thanks to you, someone can actually program this in and Phoenix Command would actually require consulting less tables !

Nah, it was fun. It allows me to figure out which equations are used to generate the to-hit probabilities, and, consequently, what those equations represent. Though, I must admit, I am still baffled as to why Barry Nakazono thought that a third-order polynomial of the natural logarithm of the range was the best way to represent the distribution of the bullets. I suspect its because the third-order polynomial is just the Taylor-expansion of the actual function, but I'm rather clueless; I simply don't recognize the function at all, and neither does Wolfram Alpha.

I suspect that if I want to reverse-engineer something, Table 5A/Automatic Fire and Shrapnel Hit Chance will be a lot easier. I suspect it's simply a binomial distribution, but I have to check.

I wasn't even actually planning to reverse-engineer the *Phoenix Command* tables, I just happened to discover the equations when working on my own overly complicated system... ^_^;

Jun 12, 2013 #4

> Phoenix Command Weapon Design said:
>
> **Damage Class (DC)**
> No formula has been found for this yet that will give a decent match. It is probably based on

LatwPIAT
Active member
Validated User

> muzzle energy and caliber, but reverse-engineering attempts have so far failed. The obvious solution is that the Damage Class must be determined by "borrowing" from a similar weapon. Taking the exact values from a weapon firing the same ammunition from roughly the same barrel length tends to do the trick, though if there is no published equivalent, guesstimation will have to be employed.

(http://pccs.understairs.nl/weapondesign.html)

That sounds like a challenge.

Barry Nakazono was, infamously, fond of using complex mathematical models to create the most realistic tabletop gun combat system in the world - though, it should be noted, he would often use mathematical models that were discredited or based on a number of assumptions that are hard to verify. The damage model, for example, is based on a variation of the Computer Man model of firearms damage, which divides the human body into thousands of small fleshy cubes, and then assigns a criticality value to each cube based on the type of tissue it is made of. Hence, a bullet that barely penetrates the skin of the head deals little damage, while a bullet with enough penetration power to enter the skull and pass through the brain deals more damage. The penetration of a bullet, meanwhile, is based on the DeMarre equations developed for Krupp during the late 19th Century - equations for iron cannonballs against ship hulls, which Nakazono apparently appropriated for bullets against generic materials. The Knockdown of each bullet is based on the discredited Taylor Knockout Value from, again, the 19th Century. (Taylor Knockout Value is what GURPS uses too.)

Sperrazza and Allen, working for the United States Department of Defence in 1965 used the results of animal testing to develop a mathematical model for the probability that a given person, when shot, would be incapacitated. The equation they used can be given as follows:

$$P(I|H) = 1 - \exp[-a*(mv^{1.5}-b)^{n}]$$

P(I|H) is the probability that, given a hit, incapacitation occurs. $mv^{1.5}$ is proportional geometric mean of momentum and energy, or simply mass times velocity$^{1.5}$. The constants *a*, *b*, and *n* are constants to be determined from the experimental results of shooting bullets into goats, and their values were for a long time considered US state secrets. However, before founding Leading Edge Games, Barry Nakazono worked for the NASA Jet Propulsion Laboratory (a job he has since returned to - yes, *Phoenix Command* is, in fact, rocket science). Since the NASA JPL did and does a lot of work for the US Department of Defence, it is entirely possible that Nakazono had access to the above equation and used it in *Phoenix Command*.

(Lest I accuse Barra Nakazono of treason and handing out US state secrets to tabletop wargamers, it's probably more likely that Nakazono *didn't* know the values of *a*, *b*, and *n* and just chose some that he felt gave the best results, or that the values were declassified by the time *Phoenix Command* was written. The former does make a lot funnier story though...)

So, what are the chances that the above equation is what's used in *Phoenix Command*?

Phoenix Command, as mentioned earlier, operates on a damage model where the exact damage dealt by a weapon is based on its damage class, how deep the bullet penetrates, and the hit location. This provides a problem when it comes to determining what each Damage Class does... but we're lucky. Table 6/Hit Location and Damage has an entry

called Torso Glance, which conveniently deals the same amount of damage for each level of penetration! This means that we now have a value of damage that is independent of penetration! However, we're not interested in *damage* per se - we want the probability that a hit incapacitates a target. If we take the liberty to interpret "incapacitated" as "dead" (since actual incapacitation is handled a slew of other mechanics), we can simply look up the probabilities that that amount of damage kills our target in Table 8A/Medical Aid and Recovery. Table 8A uses the total damage accumulated by all shots that hit, rather than a single hit, but we can simply assume that our target has only been hit by one bullet of some severity so far. (Also, in the range of damage covered by Torso Glance, the probability that death occurs is conveniently an approximately linear function of damage.)

The probability that death occurs is P(I|H)=(100-RR)/100, where RR is the Recovery Roll from Table 8A. This allows us to convert from Damage Class (DC), via Tables 6 and 8A, to P(I|H).

All we have to do now is plug in some values for mass (*m*) and velocity (*v*) to see if we can fit our function to the values.

First, we want to get rid of the exponential function. P(I|H) = 1-RR/100, so we can trivially subtract 1 from both sides and multiply through by -1, yielding

$$RR/100 = \exp[-a*(mv^{1.5}-b)^n]$$

Which can be written

$$\ln(RR/100) = -a*(mv^{1.5}-b)^n$$

It is a convenient fact of mathematics that if we have a function $y = x^q$, then a linear fit of ln against ln(x) returns *q* as the first-order coefficient of the polynomial, hence if we take the natural logarithm of both sides,

$$\ln(-\ln(RR/100)) = \ln(a*(mv^{1.5}-b)^n)$$

We can also write this as

$$\ln(-\ln(RR/100)) = n*\ln((mv^{1.5}-b)+\ln(a)$$

Wikipedia and firearms handbooks are both good sources for the mass and velocity of a bullet fires from a given gun at a given range, so pulling values of RR from the *Phoenix Command* manual, and bullet statistics from Wikipedia and other websites, for a 5.56x45mm NATO bullet fired from an M16A2, a 7.62x39mm fired from an AK47, and a 7.62x51mm fired from an FN FAL at various ranges, and ignoring b for the moment, Excel gives the following linear fit:

$$y = 0.8555x-6.0741$$

With an R^2 value of 0.9932, which is pretty good. Hence, we know that

$$n = 0.8555$$
$$\ln(a) = -6.0741$$
$$a = 0.002302$$

$$b = mv^{1.5}-(\ln(RR/100)/-a)^{1/n}$$

which yields

$b = 2.00$

Surprisingly, these values of a, b, and n are roughly accurate for all the FMJ ammunition types I modeled, including 5.56x45mm NATO, 5.45x39mm, 7.62x39mm, 7.62x51mm NATO, .32 ACP and 9x19mm Parabellum. However, according to this equation .45 ACP is much, *much* more powerful than the value *Phoenix Command* gives - though it is not impossible that Nakazono purposely fudged the damage of .45 ACP, given how heated the discussion of 9mm vs. .45 ACP can get.

Hence, with some rounding;

$$P(I|H) = 1 - \exp[-0.002*(mv^{1.5}-2)^{0.8555}]$$

We're not done yet, though. We still need to convert from P(I|H) to Damage, and from Damage to Damage Class. Luckily, this is trivial.

$$DMG = 131.76*P(I|H) - 4.517, R^2 = 0.995$$

$$DC = 2.5687*\ln(DMG) - 0.2612, R^2 = 0.9545$$

Which gives a final equation of

$$DC = 2.5687*\ln(131.76*(1 - \exp[-0.002*(mv^{1.5}-2)^{0.8555}]) - 4.517) - 0.2612$$

As with Table 2A, the values don't always match perfectly - I chose to attribute this to the fact that it's rather difficult to reverse-engineer accurately when the values are so granular and I don't know exactly what input Barry Nakazono used; he might have had slightly different figures for the exact mass and velocity of a given bullet fired from a given gun at a given range, and short of some creative application of a time-machine, I simply cannot get those values. Note also that this equation only holds for FMJ bullets; it doesn't model the damage of JHP or AP bullets.

Last edited: Jun 12, 2013

Asen_G
#3 Anti-Illusionism Squad
Validated User

Jun 12, 2013 #5

> LatwPIAT said:
>
> Nah, it was fun. It allows me to figure out which equations are used to generate the to-hit probabilities, and, consequently, what those equations represent. Though, I must admit, I am still baffled as to why Barry Nakazono thought that a third-order polynomial of the natural logarithm of the range was the best way to represent the distribution of the bullets. I suspect its because the third-order polynomial is just the Taylor-expansion of the actual function, but I'm rather clueless; I simply don't recognize the function at all, and neither does Wolfram Alpha.
>
> I suspect that if I want to reverse-engineer something, Table 5A/Automatic Fire and Shrapnel Hit

Still, it's a lot of work, and we should thank you for posting it, even if you're doing it for fun .

> LatwPIAT said:
>
> (http://pccs.understairs.nl/weapondesign.html)

> That sounds like a challenge.
>
> Barry Nakazono was, infamously, fond of using complex mathematical models to create the most realistic tabletop gun combat system in the world - though, it should be noted, he would often use mathematical models that were discredited or based on a number of assumptions that are hard to verify. The damage model, for example, is based on a variation of the Computer Man model of

One thing I can tell is, I know why he resorted to tables.
I wonder whether there are similar formulas behind the melee expansion of Phoenix Command .

Jun 13, 2013 #6

K

KingOfPain
0
Validated User

> LatwPIAT said:
>
> That sounds like a challenge.

I'm really not good at math, so I mostly skipped over your formulas, but your conclusions are very interesting.

> Hence, a bullet that barely penetrates the skin of the head deals little damage, while a bullet with enough penetration power to enter the skull and pass through the brain deals more damage.

One thing that just doesn't work in Phoenix Command (IIRC), even with Advanced Damage tables, is that a .22 to the head can sometimes be much more deadly than a 9mm e.g. because the .22 has enough force to pass through the bone once, but not twice. So instead of exiting the head it often ricochets off the bone and causes even more damage to the brain. While a .22 to the head certainly incapacitates the victim in Phoenix Command, I believe it never kills him immediately.

> However, according to this equation .45 ACP is much, *much* more powerful than the value *Phoenix Command* gives - though it is not impossible that Nakazono purposely fudged the damage of .45 ACP, given how heated the discussion of 9mm vs. .45 ACP can get.

That's very interesting indeed. While I don't think that the .45 as strong as some of its supporters believe (although I have no data to back it up, I have to admit), I always wondered if the .45 was too weak in Phoenix Command. Doesn't it have the same DC as the 9mm with a lower PEN?
Maybe it's simply a problem with the artificial limitation of having just 10 Damage Classes and the .45 wasn't powerful enough for the next DC and thus got stuck together with the 9mm? In that case your calculations could provide an answer. But since you emphasize the *much*, I suspect that this might not be the reason.
Your hypothesis certainly is quite possible.

I got interested in Phoenix Command during my "a combat system has to be as realistic as possible" phase. The more I studied it the more I thought that realism just cannot be modeled that way.
Nowadays I tend to drift towards more playable systems with less tables, and I believe that "realism" (i.e. deadliness of weapons) can be achieved more easily when weapon damage and character life are balanced the right way.

But your excursion into the mathematical depths of the Phoenix Command rules strikes

some interesting points and I'd love to hear more if you're willing to proceed.

Leonaru
Taxidermic Owlbear
Validated User

Jun 13, 2013 #7

What the... ?

jerepp
Validated User
Validated User

Jun 13, 2013 #8

I'm not surprised by the damage class calculations came from the mid 60s and values used by the government were classified. Phoenix Command always felt like "what if real world small arms combat worked just like the US government thought when they ordered the first M16 in 5.56mm" complaints about the game system from armed service veterans at the time sounded exactly like the complaints they had for their equipment issue. I kind of thought that what was needed was a bit more variability in the penetration value so implemented a house rule that the penetration value was divided by 1.x where x was the value of the last digit when you rolled on the damage table either d00 or d000 depending on which damage charts you were using. This kind of got rid of the .22 to the skull always penetrating the first layer of skull and then doing the internal ricochet thing... more like in real life a .22 to the skull would often bounce off the first layer of skull but occasionally land flush enough to penetrate. But really it seemed like adding diamond studs to an already well guilt lily.

LatwPIAT
Active member
Validated User

Jun 13, 2013 #9

> KingOfPain said:
>
> One thing that just doesn't work in Phoenix Command (IIRC), even with Advanced Damage tables, is that a .22 to the head can sometimes be much more deadly than a 9mm e.g. because the .22 has enough force to pass through the bone once, but not twice. So instead of exiting the head it often ricochets off the bone and causes even more damage to the brain. While a .22 to the head certainly incapacitates the victim in Phoenix Command, I believe it never kills him immediately.

The answer to this is, of course, it depends on how cool your gun is.

In *Phoenix Command*, rifles exist that fire .22 Long Rifle cartridges at DC1, DC2 and even DC3, with up to 1.8 PEN. A DC1 or DC2 weapon cannot ever hope to deal an "instant" (1 phase) kill with a shot to the head, but a DC3 shot to the Forehead or Eye - Nose region penetrating 1.5 or more will deal 2T damage, which is more than enough to drop a target in a single phase.

> KingOfPain said:
>
> That's very interesting indeed. While I don't think that the .45 as strong as some of its supporters believe (although I have no data to back it up, I have to admit), I always wondered if the .45 was too weak in Phoenix Command. Doesn't it have the same DC as the 9mm with a lower PEN?
> Maybe it's simply a problem with the artificial limitation of having just 10 Damage Classes and the .45 wasn't powerful enough for the next DC and thus got stuck together with the 9mm? In that case your calculations could provide an answer. But since you emphasize the *much*, I suspect that this might not be the reason.

The .45 ACP is just a 9mm Parabellum with lower penetration, yes. Analytically, through my reverse-engineering, I got that the .45 ACP should probably be DC5, or at least in the upper end, so to speak, of DC4.

> KingOfPain said:
>
> I got interested in Phoenix Command during my "a combat system has to be as realistic as possible" phase. The more I studied it the more I thought that realism just cannot be modeled that way.
> Nowadays I tend to drift towards more playable systems with less tables, and I believe that "realism" (i.e. deadliness of weapons) can be achieved more easily when weapon damage and character life are balanced the right way.
>
> But your excursion into the mathematical depths of the Phoenix Command rules strikes some

All of this came about because I was in the middle of designing my own, overly complicated firearms combat system for a homebrew RPG (I was going to simplify it once I had the perfect model! I swear!). I'd looked at *Phoenix Command* to see if it had some mechanics worth stealing but found the underlying mechanical assumptions to be completely opaque, so I just started designing my own system from scratch, only to notice certain similarities between the formulas in *Phoenix Command* and the ones I made myself, which led to reverse-engineering Table 2A, and since the feeling of accomplishment brought me no small amount of pride and joy, I decided to play around with PC a little more.

I'm willing to proceed, I'm just not sure with what; the burst/shrapnel/pellet table proved difficult to approach with the obvious method, and trying to reverse-engineer the actual damage model seems to be a nightmare. I've made some preliminary notes, but it seems that each hit location consists of different types of tissue that behave differently when exposed to different kinds of damage and penetration; this could mean a separate equation for each hit location, for each level of penetration, or roughly 500 equations in total...

Though I can state the obvious; the Arm - Bone, Forearm - Bone and Leg - Bone locations use PEN to model whether the bone is hit or not; at low PEN, the bullet just grazes the flesh, while at high PEN, the bullet strikes deep enough to hit the bone, which deals more damage. Arm - Bone, for example, has the bone be 5 PEN deep into the arm, and the flesh surrounding the bone takes minimal amounts of damage. Likewise, the throat is some 3 PEN deep into the Base of Neck location.

Rabbit Éclair
high in vital bunnytonium
RPGnet Member
Validated User

Jun 13, 2013 #10

This is bizarrely fascinating.

Last edited: Jun 13, 2013

RPGnet is joining RPGMatch. We're getting web developers, tech upgrades, and new resources of pretty much every kind!

Find out about the changes from Miss Atomic Bomb and the mods here!

[Phoenix Command] Reverse-engineering table 2A/Odds of Hitting *(1 Viewer)*

LatwPIAT · May 26, 2013 · phoenix command

Prev 1 2 3 4 5 6 Next

K

KingOfPain
0
Validated User

Jun 14, 2013 #11

> LatwPIAT said:
>
> The answer to this is, of course, it depends on how cool your gun is.

Of course it is! ;-)

> The .45 ACP is just a 9mm Parabellum with lower penetration, yes. Analytically, through my reverse-engineering, I got that the .45 ACP should probably be DC5, or at least in the upper end, so to speak, of DC4.

I checked the damage tables yesterday evening. At first DC5 sounds a bit much, while DC4 sounds more realistic for the .45 ACP. While both DCs would put the .45 ACP in the same class as the .357 Magnum its PEN is still much lower than the latter. Since the .45 ACP never has a PEN of 2 it will always land in the first column of the respective DC (unless Phoenix Command rounds up, I forgot to check that and it's literally over a decade ago that I read the rules), and in that case the damge difference isn't as severe as I feared. As it stands it makes sense that the .45 ACP has less PEN because it has the slower projectile, but due to the bigger caliber and higher mass it should definitely pack more punch than the 9mm Parabellum.

> All of this came about because I was in the middle of designing my own, overly complicated firearms combat system for a homebrew RPG (I was going to simplify it once I had the perfect model! I swear!). I'd looked at *Phoenix Command* to see if it had some mechanics worth stealing but

> found the underlying mechanical assumptions to be completely opaque

Somewhat similar to my story. In search for ideas for my "perfect" combat system I gathered almost everything that was supposed to be very realistic. But after a while I noticed that other games have similar (if not that exact) results with much less hassle. I never had the knowledge or patience to perform such an in-depth analysis as you did.

> I'm willing to proceed, I'm just not sure with what

It doesn't necessarily have to be Phoenix Command. I think a comparison to the system you are developing might be very interesting too. Unless you don't want to reveal your trade secrets of course.

Anyway, thanks for doing all the analysis and then revealing it here. I believe almost every rules system has a good idea somewhere and your work might reveal how some things that are hidden in the charts might be done in an easier way.

LatwPIAT
Active member
Validated User

Jun 14, 2013 #12

> KingOfPain said:
>
> It doesn't necessarily have to be Phoenix Command. I think a comparison to the system you are developing might be very interesting too. Unless you don't want to reveal your trade secrets of course.

I don't have "trade secrets" as much as I have "unsorted notes". While *Phoenix Command* uses the above equations, I was working on a system that used the following,

$$P(\text{Hit}) = \text{erf}(a*e^{b*[\text{skill}]}/[\text{range}])$$

The idea here can be explained roughly as follows; if you draw a normal distribution on a transparent piece of plastic and hold it at arms length, the probability of hitting anything centered in the distribution is equal to the area under the graph from the thing's leftmost point to it's rightmost point, roughly speaking. Hence, something standing twice as far away is half the width on the graph. However, certain factors affect accuracy; imagine, for example, that I said that firing a weapon in fully automatic mode doubles the width of the graph, I can assign that a flat penalty to skill of ln(2). This allows me to use simple, flat modifiers to change the width of the graph, and most things I'm interested in modelling in my firearms combat system affect the width of the graph by some multiplier; the inherent accuracy of guns and ammo, for example, is usually listed in Minutes of Arc (MoA). A gun with 2 MoA sprays bullets twice as wide as a gun with 1 MoA.

That equation can be written,

$$P(\text{Hit}) = \text{erf}(a*e^{b*[\text{skill}]-\ln([\text{range}])})$$

The Taylor expansion is defined as

$$T_n f(x) = f(a) + f^{(1)}(a)*(x-a) + f^{(2)}(a)*(x-a)^2/2 + \ldots + f \quad (a)*(x-a)^n/(n!)$$

The MacLauren expansion is the Taylor expansion in a = 0, so the MacLauren expansion of

e^x is,

$$T_n e^x = 1 + x + x^2/2 + x^3/6 + \ldots + x^n/(n!)$$

This is looking very familiar to the polynomial I got when reverse-engineering Table 2A, so I did a linear regression of $\ln(\text{erf}^{-1}(P(\text{Hit})))$ to EAL, to see if it fit this pattern when the range modifier was zero. Sadly, it did not. The probability of hitting is based on a soft quadratic curve, rather than a nice, linear function. I've provided the two for comparison:

$y = -0.0035*x^2 + 0.2917*x - 4.7969$, $R^2 = 0.9993$
$y = 0.182*x - 4.1457$, $R^2 = 0.9826$

While the latter produces accurate enough results at the tail end of the cumulative distributive function, in the middle the differences become more noticeable. For example, at EAL 14, the listed P(Hit) is 27%, while the linear function gives a P(Hit) of 17%. Differences of this magnitude is probably not good enough for *Phoenix Command* aficionados, although the following equation could easily be used in a *Phoenix Command* Retroclone, should anyone ever desire to make one.

$$P(\text{hit}) = \text{erf}(e^{0.182*(\text{SAL} + \text{ALM's})-1.286*\ln((\text{range in hexes}))+1.829})$$

For conversion purposes, it should be remembered that a *Phoenix Command* hex is 2 yards long, which is 1.829 meters, and that SAL is [skill]+6 for all values above 2, and since stats in *Phoenix Command* are generated by rolling 3d6, we don't actually have to care about the difference.

Last edited: Jun 14, 2013

Jun 14, 2013 #13

T

TristanH
Gah! DCnU!
Validated User

This thread is awesome. I have phoneix command but never managed to get anyone to give it or Living Steel a shot.

Although I have a nagging feeling that this is the start of a descent that reaches the realization that the Psyche stat can be used for everything.

Last edited: Jun 14, 2013

Jun 16, 2013 #14

LatwPIAT
Active member
Validated User

> TristanH said:
>
> Although I have a nagging feeling that this is the start of a descent that reaches the realization that the Psyche stat can be used for everything.

In PCCS, each character has a "Gun Combat Skill Level" (GCSL).

Skill Accuracy Level (SAL) = GCSL + 6
Intelligence Skill Level (ISL) = INT + GCSL
# of Combat Actions = f(Speed, ISL) = f(Speed, INT + GCSL)
Knockout Value (KV) = 0.5*WIL*GCSL

Gun Combat Skill Level can used for a lot of things, especially almost all the important stats in the game.

Last edited: Jun 16, 2013

PeterAmthor
Truly Rural
Validated User
20 Year Hero!

Jun 16, 2013 #15

Whenever ANYBODY attempts to tell you that Rolemaster or some other game is to complicated just send them to this thread. I think it would end all arguments immediately.

LatwPIAT
Active member
Validated User

Jun 16, 2013 #16

> PeterAmthor said:
>
> Whenever ANYBODY attempts to tell you that Rolemaster or some other game is to complicated just send them to this thread. I think it would end all arguments immediately.

Eh, all of these equations are things that are not in the game itself; I'm merely trying to figure out how the game was designed because the challenge amuses me, and because it sheds some light on how the system works mechanically; none of these incredibly tedious equations have to actually be solved when playing the game.

That's, of course, not to say that PCCS isn't complicated; the anatomy of a shot (using the full Advanced Rules) is as follows:

1. Chose period of aim
2. Look up your aiming ALM from your gun's table based on your period of aim
3. Look up the range ALM from Table 4A
4. Find ALM's for firer stance and weapon on Table 4B
5. Find ALM's for visibility on Table 4C
6. Find ALM's for target movement on Table 4D
7. Find ALM's for target size on Table 4E
8. Sum SAL and all ALM's and look up your chance to hit on Table 4G
9. Roll on Table 4G to see if you hit; if so, proceed
10. (Optional) Roll on Table 5A to see if you hit, if so, proceed
11. Roll EPF on Table 6D with PF as argument
12. Calculate EPEN = PEN-EPF
13. Roll on Table 6A with EPEN and DC as arguments
14. Target rolls for knockout on the Knockout Table.

When making a successful shot, you look up modifiers from five different tables, roll once or twice to hit, once more to see how much your shot glances, then once for hit location, and then the target rolls once more to see if they're knocked out. That's nine to ten tables and four to five rolls per shot; excessive by most standards, where you expect one table of modifiers and at most two rolls.

Last edited: Jun 16, 2013

LatwPIAT
Active member
Validated User

Sep 6, 2013 #17

When firing bursts of automatic fire, *Phoenix Command* uses a two-part system where you first roll to see if you're firing at the correct elevation, and then roll again to see if anyone caught in your arc of fire are hit by any of the bullets fire. The chance to be firing at the correct elevation is found under the "Burst Elev." column on table **Odds of Hitting/4G**. The equation is simply:

$$P(\text{correct elevation}) = \text{erf}(0.0947*e^{0.1176*SAL})$$

Then, table **Automatic Fire and Shrapnel Hit Chance/5A** has both an Arc of Fire and an Index hit column for independent variables. I'm not actually sure what the Index *does*, but it's pretty easy to convert from Arc of Fire to Index:

$$\text{Index} = -7.302*\ln(\text{Arc of Fire})+16.189,\ R^2 = 0.9994$$

The chance to hit with a single bullet is given by:

$$P(\text{hit within arc}) = \text{erf}(0.0123*e^{0.1406*\text{Index}})$$

And the actual value in the table is the expected value of bullets that will hit the target for a given probability and number of bullets fired. This is the mean value for a binomial distribution, so it's trivial to calculate. *Phoenix Command* always rounds values in this table if they're greater than 100%; if the probability is greater than 100%, it's rounded to the nearest whole number, and is the number of bullets that hit.

$$E(\text{number of bullets that hit}) = P(\text{hit within arc})*[\text{Rate of Fire}]$$

Since I'm also pretty close to having a working system for calculating damage based on hit-location, penetration and bullet mass and velocity, I could probably hash out a *Phoenix Command* retroclone over the weekend. If I wanted to.

Last edited: Sep 7, 2013

J

Jdidgits
Registered Loser
Validated User

Sep 6, 2013 #18

Gosh, I remember when a friend and I used to just roll up random combat situations with the rules to this game. We didn't bother to actually "play" the game - just simulated absurd combat scenarios.

Good times.

LatwPIAT
Active member
Validated User

Sep 7, 2013 #19

The damage tables in *Phoenix Command* take up two entire pages, and a supplement was even released that contained nothing except damage-tables covering the full range of over 100 different hit-locations on the human body, telling you exactly where in the body you hit, going as far as to even model how deep into the body the shot went and which vital organs it passed through on it's way, whether any bones were broken by the shot. It's complex, and perhaps unnecessarily so.

There are rules for bullet deflection by armour in the game, but if we ignore those for a moment and focus only on bullets that fully pass through any given hit-location, the damage-equation becomes rather simple:

$$\text{Damage} = [\text{location damage base}]*e^{0.7*DC}$$

It's not 100% perfect, in part due to how *Phoenix Command* rounds values above 100 to the nearest multiple of 100, and values above 1000 to the nearest multiple of 1000, etc., and in part because locations marked "[limb] Glance" tend to use the following equation instead:

Damage = [location damage base]*$e^{0.35*DC}$

Now, since humans are usually better equipped to handle addition than they are exponentiation, it would be a lot simpler to write down the log of damage than the damage itself. Then the amount of damage dealt could simply be calculated as "ln(location damage) + DC", rather than having to look it up in an unwieldy table. Unfortunately, since the Recovery Roll is calculated by taking the sum total of all damage, dealing with the logarithms of damage becomes somewhat awkward; if we have ln(a) and ln(b), figuring out ln(a+b) is not a trivial task. (It can be done, but it's not easy unless you have a slide ruler or calculator available, and to the best of my knowledge, most role-players don't really enjoy having to reach for a slide ruler every time their character gets shot...)

So if we want to write down ln(damage) instead of damage, we'll be forced to keep track of each wound separately. This actually produces almost the exact same result as if we just summed the damage! The Recovery Roll for a damaged person receiving no medical help is given by the following equation:

P(survival) = 0.97*$e^{-0.01*[damage]}$, R^2 = 0.9979

This can be written as:

P(survival) = 0.97*$e^{-0.01*exp([location base]+DC)}$, R^2 = 0.9979

In *Phoenix Command*, you simply roll once for all damage taken. If we keep track of wounds separately, we'll have to roll once for each wound.

P(survival, all wounds) = P(survival, wound 1)*P(survival, wound 2),*...*P(survival, wound n)

One of the identities of exponentiation is that $a^n*a^m = a^{n+m}$. We have $a^{b\^n}*a^{b\^m}$, which is $a^{e\^n+e\^m}$. But... that's what we want. If we have two wounds, for convenience both to the Forehead location, one at DC 2 and one at DC 3, we can write that in log-form:

ln($damage_1$) = ln(1988) + 0.7*2, ln($damage_2$) = ln(1988) + 0.7*3[/super]

We're, however, interested in knowing out chances of survival at the *total* amount of damage:

Damage = $e^{ln(2000)+0.7*2}+e^{ln(2000)+0.7*3}$

P(survival) = P(survival, wound 1)*P(survival, wound 2) = 0.97*$e^{-0.01*damage_1}$ * 0.97*$e^{-0.01*damage_2}$

P(survival) = 0.97^2*$e^{-0.01*damage_1-0.01*damage_2}$ = 0.97^2*$e^{-0.01*exp(ln(1988) + 0.7*2)-0.01*exp(ln(1988) + 0.7*3)}$

And since:

$$\text{Damage} = e^{\ln(2000)+0.7*2}+e^{\ln(2000)+0.7*3}$$

We've simply got:

$$P(\text{survival}) = 0.97^{2}*e^{-0.01*\text{Damage}}$$

Which is pretty close to the actual recovery roll; if we round that 0.97 to 1.00, we have a system that requires smaller tables, less math, can keep track of individual wounds, yet has the same lethality as *Phoenix Command*'s extensive tables - simply at the cost of having to roll for every wound instead of once for all wounds.

Last edited: Sep 7, 2013

Sep 7, 2013 #20

D

double8infinity8
armchair insurrectionist
Validated User

I had to register here just to show my support for your efforts, LatwPIAT! The math you're accomplishing/performing is way, way - way - beyond me, but I've always had a gnawing love of Phoenix Command; it's absolutely great to see work underway toward opening the system up! A retro clone would be fantastic! I've just recently been looking for a good set of generic'ish table-top skirmish rules... but I want something _chewy_ and crunchy - Pheonix Command would seems a perfect fit. Having access to a freely available retroclone would certainly be a welcome contribution.

Back to lurk mode, following this thread intently.

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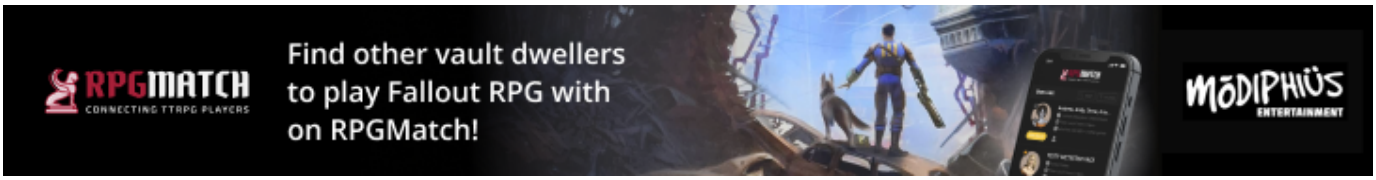
[Phoenix Command] Reverse-engineering table 2A/Odds of Hitting *(1 Viewer)*

LatwPIAT · May 26, 2013 · phoenix command



D

double8infinity8
armchair insurrectionist
Validated User

Sep 7, 2013 #21

> LatwPIAT said:
>
> Which is pretty close to the actual recovery roll; if we round that 0.97 to 1.00, we have a system that requires smaller tables, less math, can keep track of individual wounds, yet has the same lethality as *Phoenix Command*'s extensive tables - simply at the cost of having to roll for every wound instead of once for all wounds.

Also: I like the idea of having the ability to track individual wounds - for a system that goes to such great lenght to detail everything, it seemed strange to then abstract out the wounds into a homogenous lump. What's an few extra dice rolls when you're already rolling 5+ times... especially when taken into account the fact that whoever is actually using such a detailed system, is probably doing so specifically because of all the extra detail.

How would healing time / recovery equations/tables need to be modified in order to handle multiple distinct wounds?

LatwPIAT
Active member

Sep 13, 2013 #22

> double8infinity8 said:
>
> How would healing time / recovery equations/tables need to be modified in order to handle multiple distinct wounds?

Validated User

In essence, not at all. It won't perfectly recreate *Phoenix Command* (but then, I'm not aiming too either), but in essence you just say that each wound heals at its own rate, but the Critical Period for all wounds is the shortest of all Critical Periods of all wounds - or simply ignore that and have each wound have its own CTP; the effect of having two wounds on healing time tends to be roughly the same as having one wound, since the CTP grows with the logarithm of the damage.

I decided the revise the equation I had for Damage Class (DC). It was an equation, and it would give the right numbers from time to time, but it was ugly and incomprehensible. So I just tossed together a bunch of value for different calibers at different ranges, using real-life values for velocities at various ranges, and the DC from *Phoenix Command* and its supplements; the Civilian Weapons Supplement and the WWII Weapons Supplement were especially useful, since they have unusual calibres I can treat as extra data-points.

The good news is I've managed to reduce DC to a much simpler equation.

$$DC = 2.6791\ln(0.5*mass*velocity^{1.5}) - 5.0963,\ R^2 = 0.9173$$

The bad news is that quite a lot of weapons tend to be a Damage Class higher or lower than their mass and velocity would indicate, especially handgun bullets - heavier rifle bullets, meanwhile, are pretty accurately statted up with the above equation.

It should be noted that *Phoenix Command* has only ten Damage Classes. This was probably useful when they had to provide full tables on penetration and hit-location for every damage class, but unnecessary if we can use an open-ended system for determining damage to a given hit location, it's possible to have open-ended Damage Classes too. Technically they can extend towards infinity, though I'm pretty certain that DC 47 will be the absolute necessary maximum. At DC 47, the toughest person in the world will be shot instantly dead by a glancing, 0.1 PEN bullet to the hand.

I've been shown by a very helpful fellow the equations for determining actions and speed based on a character's stats and encumbrance. In purely mathematical terms, they seem quite unproblematic, but in terms of generating a character, they're unwieldy which makes them unsuited for printing as anything but a table of pre-calculated values. In terms of making a retroclone, there's also the issue that some values don't have a "real-life counterpart", or equation to go with them. The -5 to hit a ducking target is something that I could write into a retroclone, but it would just be rote copying from the *PCCS* corebook. (Yay! Plagiarizing entire tables of modifiers!) So I'm kind of loath to do that in anything I can publish, even if it's non-commercial, restrictions-free Internet-publishing. The OGL is what makes *D&D* retroclones so viable - no such thing exists for *PCCS*.

jerepp
Validated User
Validated User

Sep 13, 2013 #23

It would be cool to do as a virtual tabletop thing where you could use pure functions instead of clumsy inaccurate tables. Then the published rules would essentially be how to create charaters and the mechanics can be blacked in the VTT mod and presumably safe from accusation of plagerism. Also the VTT handling all the mucky bits should reduce the amount of people scared off by all the lookup/calculation.

Last edited: Sep 13, 2013

Amberpup
Validated User
Validated User
20 Year Hero!

Sep 13, 2013 #24

We actually used Phoenix Command for our table top games of 'Killer'... pick a gun(s) and kill the rest of the players on the board for the $10,000 dollar prize. For us, it was the knockout rule that really annoyed the players because even if it was for a short time it seemed forever in combat turns.

And we had more then few eyeball/head shots from folks peeking around corners. Hand mirrors became a fan fav after the 3rd or 4th one.

D

double8infinity8
armchair insurrectionist
Validated User

Sep 13, 2013 #25

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LatwPIAT
Active member
Validated User

Sep 17, 2013 #26

> Jospeh said:
>
> I believe I know the actual formula used to calculate PEN. I should have realised earlier, since it is simply the DeMarre penetration equation **scaled to energy** rather than thickness penetrated.

http://groups.yahoo.com/neo/groups/phoenix_command/conversations/topics/6310

Penetration scaled to energy is a bit weird; wouldn't it make more sense to scale it to thickness, so you can easily calculate how far into an object the projectile travels with trivial ease? For a while, I thought this was just one of those weird *Phoenix Command* obfuscated mechanics Barry Nakazono used to make reverse-engineering PCCS difficult.

And then I read the rules for how PEN actually works.

The Effective Penetration (EPEN) is given by the equation

EPEN = PEN - EPF

But if EPEN is less than EPF, the Damage Class is reduced to DC 1. What this actually means in the mathematical surreality *Phoenix Command* models is that if the bullet spent a lot of energy penetrating armour, it has less energy and deals less damage. I re-ran my logarithmic regression plots, and DC scales better with energy ($0.5*m*v^2$) than it does with the geometric mean of energy and momentum ($m*v^{1.5}$). Mechanically, if the bullet has lost half its energy or more, it's reduced to DC 1. Knowing this, it's actually possible to scale the loss in DC with the ratio between EPEN and EPF, using the following equation:

$$DC\ loss = 2.1827*\ln(^{EPEN}/_{EPF})$$

And scaling DC properly, that is, to energy instead of $m*v^{1.5}$:

$$DC_{FMH} = 2.1827*\ln(0.5*m*v^2) - 10.03,\ R^2 = 0.9244$$
$$DC_{JHP} = 2.2271*\ln(0.5*m*v^2) - 8.873,\ R^2 = 0.8842$$
$$DC_{AP} = 2.0837*\ln(0.5*m*v^2) - 9.5743,\ R^2 = 0.8883$$

I also had a crack at trying to reverse-engineer the damage-tables from the *Phoenix Command Combat System Hand-to-Hand Supplement*. By plotting PD against ID for a number of hit locations on the Blunt Damage Table, I discovered that the curves have the same *shape* as the curves for PD against PEN on the firearms damage tables from the *Advanced Damage Tables* supplement. By transforming the plots using simple translations and scaling, I discovered that, roughly, the DC of a blunt weapon attack is DC 1, and the PEN is a fifth of the ID of the attack.

$$DC_{blunt} = 1$$
$$PEN_{blunt} = 0.2*ID$$

This at least holds true for the Base of Neck and Forehead; Heart seemed to use DC 0. I've not yet managed to find consistent transformations for Cutting, Stabbing and Flange damage.

Last edited: Sep 17, 2013

Asen_G
#3 Anti-Illusionism Squad
Validated User

Sep 17, 2013 #27

> Amberpup said:
>
> We actually used Phoenix Command for our table top games of 'Killer'... pick a gun(s) and kill the rest of the players on the board for the $10,000 dollar prize. For us, it was the knockout rule that really annoyed the players because even if it was for a short time it seemed forever in combat turns.
>
> And we had more then few eyeball/head shots from folks peeking around corners. Hand mirrors became a fan fav after the 3rd or 4th one.

Gotta admit, the more I think about this idea, the better I like it .
Also, there's a reason people use hand mirrors in this exact way, and it's to avoid getting shot. I'm sure the author would be proud with your game !

JoeNotCharles
Validated User
Validated User

Sep 17, 2013 #28

> LatwPIAT said:
>
> The good news is I've managed to reduce DC to a much simpler equation.
>
> $$DC = 2.6791\ln(0.5*mass*velocity^{1.5}) - 5.0963,\ R^2 = 0.9173$$
>
> The bad news is that quite a lot of weapons tend to be a Damage Class higher or lower than their mass and velocity would indicate, especially handgun bullets - heavier rifle bullets, meanwhile, are pretty accurately statted up with the above equation.

Is it possible the author used different equations for different classes of firearm? One for handguns, one for rifles, etc?

HyperBear
Designated Import
Validated User

Sep 17, 2013 #29

> LatwPIAT said:
>
> The damage model, for example, is based on a variation of the Computer Man model of firearms damage, which divides the human body into thousands of small fleshy cubes, and then assigns a criticality value to each cube based on the type of tissue it is made of. Hence, a bullet that barely penetrates the skin of the head deals little damage, while a bullet with enough penetration power to enter the skull and pass through the brain deals more damage.

That really explains a lot. For instance, it explains why arterial damage isn't modelled. 740 is the highest damage you get from hitting the thigh (and that's from hitting the bone with a damage class 10 weapon). The system simply didn't model a projectile clipping the femoral artery and someone bleeding out from that.

It would be interesting to see someone leave the ballistics side of the game intact but correct some of the assumptions in the damage model.

> double8infinity8 said:
>
> Also: I like the idea of having the ability to track individual wounds - for a system that goes to such great lenght to detail everything, it seemed strange to then abstract out the wounds into a homogenous lump. What's an few extra dice rolls when you're already rolling 5+ times... especially when taken into account the fact that whoever is actually using such a detailed system, is probably doing so specifically because of all the extra detail.

This was always the biggest knock against the system's supposed accuracy. He went to great lengths to come up with accurate ballistic calculations, but damage was handled as one big abstract lump, and he modelled the skill of the shooter in an even more abstract fashion. The Skill Accuracy Level (SAL) -- the basis of the Shot Accuracy, which is the basis of the odds of hitting -- is rated in levels from 0 to 20. (It's worse than that, as the pre-generated troops are rated from level 0 to 7, with two levels "skipped".) While the firearms are accurate, every soldier in existence starts with a base SAL of 0, 5, 7, 10, 11, or 13.

The system started life as an accurate firearms module that was intended to be grafted onto an old school level-based RPG system.

LatwPIAT
Active member
Validated User

Sep 17, 2013 #30

> JoeNotCharles said:
>
> Is it possible the author used different equations for different classes of firearm? One for handguns, one for rifles, etc?

It's possible. One of the problems with that is that due to the high variation, I'd need a lot of data-points to verify it. In terms of mathematics, to find the data points would be trivial; consistent formulas for the decay of PEN with range have been found, and PEN is a function of energy and calibre; this allows me, for any given weapon, to find the energy as a function of range, which can then be plotted against the DC for a given range.

It's just that the data-entry takes a lot of time and is rather boring.

> agoodall said:
>
> That really explains a lot. For instance, it explains why arterial damage isn't modelled. 740 is the highest damage you get from hitting the thigh (and that's from hitting the bone with a damage class 10 weapon). The system simply didn't model a projectile clipping the femoral artery and someone bleeding out from that.
>
> It would be interesting to see someone leave the ballistics side of the game intact but correct some of the assumptions in the damage model.

740 damage does mean a CTP of 6 minutes and a 1% chance of making the recovery-roll if receiving no aid. I couldn't find out exactly how fast someone will bleed to death from a wound to the femoral artery in the thigh, and I got estimates saying "3 minutes if bleeding is unrestricted" and "5-60 minutes". But, yes, the damage-model doesn't take into account things like critical veins; the Computer Man model didn't take it into account, and that was one of the major criticisms against it. (Also if you get hit in the thigh bone by a DC 10 .50 cal BMG bullet, there's a fairly high chance the leg will be *severed*, something PCCS certainly doesn't take into account...) Though I'm not sure how easy it would be to model fatal cutting of the femoral artery by small-arms fire, and whether it's even desirable to add the necessary complexity. *Phoenix Command* is pretty time-consumingly complex already.

But, hey, if you want a system that's even more complex in the name of mathematical reality, *Phoenix Command* is really just a simplified version of *Spectrum: Small Arms* (also by Barry Nakazono.) Though since I don't have a copy of SSA (it's not just rare, it's *obscure*), I don't actually know if it has a better damage model.

Both the ballistics model and the abstract manner in which PCCS handles damage are things I'm quite fond of. I started disassembling PCCS because I wanted to see if it had useful mechanics for my own system, and I imagine that if I could have a way to make various Medical skills influence the CTP and RR of a wound, I could have a system where medical aid has an element of urgency to it, and multiple medics could prioritize and treat multiple wounds simultaneously. Part of what I personally think makes combat in most RPGs interesting is the ebb and flow back and forth between the combatants, and having ebb-and-flow in other subsystems could make them interesting too.

Though I probably won't include that level of detail in my *OpenCommand* retroclone, where I just aim to simplify PCCS' mechanics towards playability. (Which is proving somewhat difficult; it's so hard to tell what to cut and what not to cut; removing the glancing rolls would remove a full dice roll, which saves immense amounts of time - but it reduces the precious realizmz! - and hit locations are pretty much mandatory to keep, but that still means that each shot takes two to three rolls of 1d100 to resolve. This will be a major time-sink, and I'm not sure how to simplify it.)

> agoodall said:
>
> This was always the biggest knock against the system's supposed accuracy. He went to great lengths to come up with accurate ballistic calculations, but damage was handled as one big abstract lump, and he modelled the skill of the shooter in an even more abstract fashion. The Skill Accuracy Level (SAL) -- the basis of the Shot Accuracy, which is the basis of the odds of hitting -- is rated in levels from 0 to 20. (It's worse than that, as the pre-generated troops are rated from level 0 to 7, with two levels "skipped".) While the firearms are accurate, every soldier in existence starts with a base SAL of 0, 5, 7, 10, 11, or 13.

SAL is rated from 0 to 26, though, yes, 1-4, 6 and 8 aren't possible SAL values for a character, oddly enough. Personally, I like SAL conceptually; it models, roughly, the minimum width of the cone of fire the shooter is able to shoot consistently within, which is both *functional* measure of skill, and roughly similar to how the US Army rates their soldiers' shooting skills.

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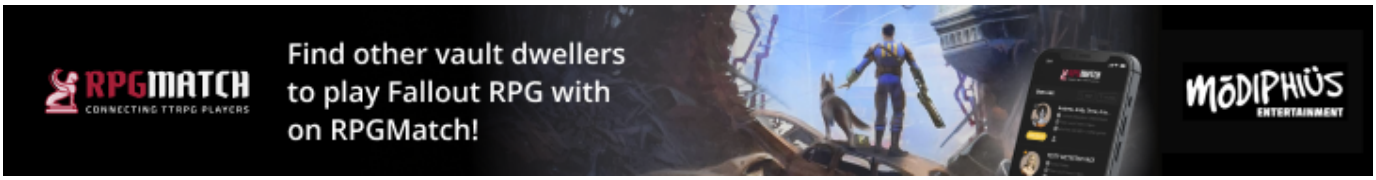
[Phoenix Command] Reverse-engineering table 2A/Odds of Hitting *(1 Viewer)*

LatwPIAT · May 26, 2013 · phoenix command



K

KingOfPain
0
Validated User

Sep 18, 2013 #31

> LatwPIAT said:
>
> Penetration scaled to energy is a bit weird; wouldn't it make more sense to scale it to thickness, so you can easily calculate how far into an object the projectile travels with trivial ease?

While energy certainly is a factor (a bullet probably won't penetrate when it is thrown, unless the target is just a piece of paper), it isn't as important as one might think.
I believe according to physics density is more important. If the density of the projectile is much higher than that of the target it will penetrate further. If the density is actually lower, it won't penetrate at all (e.g. throwing a tomato against a wall).

> But if EPEN is less than EPF, the Damage Class is reduced to DC 1. What this actually means in the mathematical surreality *Phoenix Command* models is that if the bullet spent a lot of energy penetrating armour, it has less energy and deals less damage.

I wonder how that works out for buckshot. It certainly won't penetrate kevlar, but its mechanism of reducing energy by distributing it over a bigger surface just doesn't work for several hits at the same time. A close range shotgun will most likely still kill you simply due to the kinetic energy to the internal organs.

JoeNotCharles
Validated User
Validated User

Sep 18, 2013 #32

Hit location is d1000 while hit roll is d100, right? I'll assume glancing blow is also a d100. So use a variant of the Warhammer hit location trick: get 3 dice of different colors (say red, green, blue) and roll them all: hit roll is RG, glancing blow is GB, hit location is BGR. So, with R=4, G=9, B=2, hit roll is 49, glancing blow is 92, hit location is 294. I don't think this messes up the probabilities too much as long as each type of toll uses a different die for the most significant digit.

LatwPIAT
Active member
Validated User

Sep 18, 2013 #33

> KingOfPain said:
>
> I wonder how that works out for buckshot. It certainly won't penetrate kevlar, but its mechanism of reducing energy by distributing it over a bigger surface just doesn't work for several hits at the same time. A close range shotgun will most likely still kill you simply due to the kinetic energy to the internal organs.

In PCCS, buckshot at close range is treated as a single projectile. The *Advanced Rules For Small Arms Combat* supplement also has rules for damage resulting from blunt trauma caused by bullet impact, but implementing those rules is a very low priority for me.

> JoeNotCharles said:
>
> Hit location is d1000 while hit roll is d100, right? I'll assume glancing blow is also a d100. So use a variant of the Warhammer hit location trick: get 3 dice of different colors (say red, green, blue) and roll them all: hit roll is RG, glancing blow is GB, hit location is BGR. So, with R=4, G=9, B=2, hit roll is 49, glancing blow is 92, hit location is 294. I don't think this messes up the probabilities too much as long as each type of toll uses a different die for the most significant digit.

Hit-location is d100 unless you're using the Advanced Damage Tables, and the glancing roll is 1d10. In any case, dependent probabilities give odd results. In your example, shots that hit will have a tendency to result in a low EPF, and shots that penetrate well will tend to penetrate in the upper arm-chest-head region.

> JoeNotCharles said:
>
> Is it possible the author used different equations for different classes of firearm? One for handguns, one for rifles, etc?

I managed to find some more firearms data yesterday (from the *Civilian Weapons* supplement), and punching them into my spreadsheet, it seems that handguns and rifles use the same equation.

David J Prokopetz
Social Justice

Sep 18, 2013 #34

> LatwPIAT said:
>
> I managed to find some more firearms data yesterday (from the *Civilian Weapons* supplement), and punching them into my spreadsheet, it seems that handguns and rifles use the same equation.

I suppose one can never exclude the possibility that the author went to the trouble of working out all these complex formulas, then went and arse-pulled a bunch of values at

Henchman

RPGnet Member

Validated User

the end anyway because his favourite handgun's stats didn't "feel right".

Amberpup

Validated User

Validated User

20 Year Hero!

Sep 18, 2013 #35

> David J Prokopetz said:
>
> I suppose one can never exclude the possibility that the author went to the trouble of working out all these complex formulas, then went and arse-pulled a bunch of values at the end anyway because his favourite handgun's stats didn't "feel right".

He won't be the first to do that, at least in some of the other systems I've played. Come to thing about it, same in some of the WW2 tank games I've played in.

LatwPIAT

Active member

Validated User

Sep 18, 2013 #36

> David J Prokopetz said:
>
> I suppose one can never exclude the possibility that the author went to the trouble of working out all these complex formulas, then went and arse-pulled a bunch of values at the end anyway because his favourite handgun's stats didn't "feel right".

I'm half-tempted to make the rules for creating your own weapons in OpenCommand "Calculate Damage Class as 'DC = $2*\ln(0.5*mass*velocity^2)-9$', then roll two FUDGE dice and add the result to the DC."

S

Stupid Made Up Name

David

RPGnet Member

Validated User

Sep 18, 2013 #37

> David J Prokopetz said:
>
> I suppose one can never exclude the possibility that the author went to the trouble of working out all these complex formulas, then went and arse-pulled a bunch of values at the end anyway because his favourite handgun's stats didn't "feel right".

I recollect that in FGU's "Aftermath" there is a worked example of adding a new gun to the game - a 44 magnum - and at some stage in the process of technical calculation the damage is explicitly doubled by fiat because, hey, it's the most power gun ever, right?

LatwPIAT

Active member

Validated User

Sep 21, 2013 #38

Well, I've been meaning to work on *OpenCommand*, and technically I have, it's just kinda boring because there are only so many ways to phrase "look up values A and B in table C and roll under number D to do E unless there's an asterisk in which case do F", which roughly describes about half the rules for *Phoenix Command*... Also, writing large tables in LaTeX is a chore, and formatting them correctly is like navigating a minefield...

...so I decided to distract myself with the close-combat rules from the *Hand to Hand Combat System* - I was going to look at how those rules work anyway for my overly complicated homebrew game, so I decided to figure out how they work. The answer to that is... I have no clue. The Impact Damage seems to scale roughly with the number of inches into the body the weapon penetrates (which can be seen readily from the fact that the Beaked Axe is described as having a 3-inch beak and maxes out as 3 effective ID, as well as comments in *Sword's Path Glory* (Nakazono's RPG system for, essentially, making

D&D medieval combat more realistic) about how inches of cutting depth are modeled by ID.) It then makes sense that PEN and ID are related so that firearms and melee weapons can use the same tables (which isn't too surprising; if Nakazono already had access to an advanced computer model of medical trauma, why not use it?), where Cutting has DC 5, Stabbing has DC 4, and Blunt has DC 1, except that sometimes this will give the wrong values for some locations, and sometimes I simply can't *tell* if things match up because Melee Combat's damage tables model different parts of the body, or different portions of the same part of the body.

However, a kind person graciously told me the equation for figuring out the Hand-to-Hand hit-probabilities.

$$P(\text{to hit}) = 0.93*[1-(F*Q)/100]/0.9^{AL-1}$$
$$Q = 1-(2/3)^{DL+1}$$

Where AL is the Attack Level, DL is the Defence Level, and F is a function of the Parry Class that is best looked up in a table so I won't reproduce it here.

And in *Phoenix Command*, these are given in a list of tables for each DL, where you have to cross-reference AL and PC. Which is awkward, because as far as I can tell (though I may be missing something), DL doesn't actually change during combat, and there are only 10 Parry Classes but technically unlimited DLs. Maybe it's because of how big the tables get, but it would have been easier mechanically to organize them by PC and then cross-referencing AL and DL on each table.

But why stop there? You'll note that F*Q is independent of AL; a change in DL affects F*Q the same no matter what the value of AL is. This means that the 12-or-so different hit-probability tables could be split into only *two* tables. One which takes in Parry Class and Defence Level and returns F*Q, and one that takes in F*Q and Attack Level and returns the target number for a dice roll.

This way, each character sheet could have an F*Q value for each Parry Class written on it at character generation, and whenever a character is attacked, you cross-index the F*Q value from the Defender's sheet and the AL from the attacker's sheet on a single table to get the target number for the roll.

Sep 23, 2013 #39

K

KingOfPain
0
Validated User

> LatwPIAT said:
>
> Also, writing large tables in LaTeX is a chore, and formatting them correctly is like navigating a minefield...

Ah, the joys of LaTeX. I once used the ChemTeX macros to layout a highly detailed Luminol reaction formula on one page (ChemTeX officially only worked with TeX so I had to work with 10pt in LaTeX, otherwise the results were totally off). It took me a whole day to write the code and then it took my Atari 1040 ST with a 8 MHz 68000 CPU whole two minutes to process that single page...

> ...so I decided to distract myself with the close-combat rules from the *Hand to Hand Combat System* - I was going to look at how those rules work anyway for my overly complicated homebrew game, so I decided to figure out how they work. The answer to that is... I have no clue.

Unfortunately I don't remember any details, but I believe a few weapon damages felt really strange. (Maybe some improvised weapons being similar to a sword or something like that?)

Last edited: Sep 23, 2013

HyperBear
Designated Import
Validated User

Sep 23, 2013 #40

Question: has anyone ever reverse engineered the stats from the *Aliens* board game, either as a conversion from *Phoenix Command/Living Steel/Aliens RPG* or from base formulas?

I always liked the clean system in the *Aliens* board game and thought it would make a decent basis for a generic miniatures game. I was wondering if anyone ever did the conversion.

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[Phoenix Command] Reverse-engineering table 2A/Odds of Hitting *(1 Viewer)*

LatwPIAT · May 26, 2013 · phoenix command

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Sep 23, 2013 #41

J

jerandall
Validated User
Validated User

This thread brings back vivid memories of actually playing Phoenix Command during summer camp.

It was as nerdy as you might imagine. There we were, in the beautiful outdoors with all the amenities of your average American summer camp, and we spent our time *really accurately* pretending to be in Vietnam-era small arms battles.

= = =

Do I recall correctly that PC also has an incredibly elaborate system for tracking "encumbrance" (in D&D terms)?

Sep 23, 2013 #42

LatwPIAT
Active member
Validated User

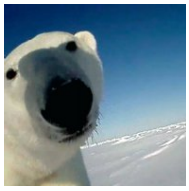
> agoodall said:
>
> Question: has anyone ever reverse engineered the stats from the *Aliens* board game, either as a conversion from *Phoenix Command/Living Steel/Aliens RPG* or from base formulas?

Which stats are you interested in? There's a pretty fair chance they're simply *Phoenix Command* stats.

> jerandall said:

> Do I recall correctly that PC also has an incredibly elaborate system for tracking "encumbrance" (in D&D terms)?

It's not elaborate for tracking it; then you just write down all the weights and sum them. However, you'll need to cross-reference your encumbrance and three different values in three different tables every time your encumbrance changes significantly...



HyperBear
Designated Import
Validated User

Sep 24, 2013 #43

> LatwPIAT said:
>
> Which stats are you interested in? There's a pretty fair chance they're simply *Phoenix Command* stats.

Each character has a limited number of actions per turn, just like in PCCS, but they get way fewer actions per turn in the *Aliens* board game (for example, Vasquez gets up to 2 actions). Each aim time line cross indexes range with a number. This number is the character's chance of hitting. In essence, it combines SAL with some set of average modifiers and the accuracy of the weapon to come up with a single to-hit number.

I haven't been able to reverse engineer the modifiers that went into the to-hit number, or the number of aim actions in PCCS that make up 1 action in the board game.

Here are the to-hit stats for Vasquez's machine gun (Vasquez gets up to two actions per turn):

RANGE
AIM TIME 1 2 3-4 5-6 7+
1 8 6 3 2 1
2 13 9 8 7 6

Here are the stats for her Pulse Rifle:

RANGE
AIM TIME 1 2 3-4 5-6 7+
1 6 4 2 1 0
2 13 9 8 7 5

LatwPIAT
Active member
Validated User

Sep 27, 2013 #44

Hmm, it's hard to tell there, actually.

Remember I talked about how to simply this monster?:

$$P(\text{hit, hand-to-hand}) = 0.93 * [(1-F(1-(2/3)^{DL+1}))/0.9^{AL-1}]$$

By reducing it from twelve to two tables, only one of which had to be referred to during the game? I works, but if you absolute *hate* tables, I realized what it actually models mathematically. If we expand it, we get:

$$P(\text{hit, hand-to-hand}) = [(F-1)*0.9^{2-AL} + F*0.9^{4*DL+6-AL}]$$

Which exploits that $0.9^4 \sim= 2/3$, and $0.93 \sim= 0.9$. So what does this mean, as a simulation of reality? What happens is that first you check whether you're stopped by the parry or

not. The parry has an F chance of succeeding, and an (1-F) chance of failing. If the Parry fails, the attacker gets to attack unhindered, which has a $0.93*0.9^{1-AL}$ chance of hitting. (Which for almost all positive values of AL always succeeds.) If the Parry succeeds, the defender gets to oppose being hit with a melee weapon; the attacker now has a $0.93*0.9^{4*DL+5-AL}$ chance of succeeding. The greater the defender's DL, the harder they are to attack through the parry of.

Conveniently, 0.9^{X} is an easy function to represent with dice; you have a dice pool, and to succeed in an attack, you have to roll 10 on all of x 10-sided dice. The smaller the dice pool, the larger the chance of success, and vice versa. If this feels like an un-intuitive use of dice pools, just say that it's the defender that gets to roll. The defender needs at least one success, where a success is defined as "not a 1". Rolling 0 dice is, of course, a success for the attacker and a loss for the defender.

This way, you can reduce the tables in the *Phoenix Command Hand-to-Hand Combat* supplement to a single roll of a D10 followed by use of a dice pool system similar to the one used in the oWoD systems, rather than having to use tables all the time. (So if you feel that *Dark Ages: Vampire* doesn't have realistic enough melee combat, you can easily adopt these rules with the existing oWoD dice system.)

Last edited: Sep 27, 2013

LatwPIAT
Active member
Validated User

Oct 18, 2013 #45

I implemented the hit-locations table today. It, more than anything else, is the heart and soul of *Phoenix Command*. My spur-of-the-moment PCCS retroclone isn't quite finished yet, but it's getting there; the character-generation rules are all done, as are the wounding and most of the firearms rules. The only things that really are left are the movement rules, which are a bit of a hassle, and the medical recovery tables, which are proving to be a chore. My first instinct was to chance from PCCS' hex-based system to one that just deals with absolute ranges, but since keeping track of facing is important in PCCS, trying to write hex-less rules for facing and turning got somewhat awkward. The medical recovery tables, meanwhile, are just proving to be analytically *hard* to crack. At the first glance, CriTical Period per Physical Damage appear to be a simple exponential decay, but on closer observation they have points of inflection that means they decay slower than exponentially. I tried to plot the CTP against the logarithm of damage, but that just gives some sort of nigh-impenetrable Sigmoid function.

I had a look at *Sword's Path: Glory*, Nakazono's attempt at a *D&D* heartbreaker. It has damage tables too, but different ones that give rather different results at times; they work well for untreated wounds, but can't be used for the First Aid, Aid Station, Field Hospital or Trauma Centre columns. And, sadly, I don't have a copy of *Spectrum: Small Arms*, PCCS' insanely detailed predecessor, so I can't see if it has more penetrable or mathematically elegant CTP tables. (Though, certainly, if someone has the free time do the data-entry for whatever system SSA uses and then tell me what formulas best fit, I'd be very grateful.) Still, this means that beyond trying to figure out the dastardly CriTical Period tables, the design of *OpenCommand* is all but finished.

So that leaves me with a question; what do *you* people want? If you're ever going to sit down and use *OpenCommand* for anything, or steal rules from it to run *GURPS* and *Delta Green* homebrews with or whatever, what do you want the system to have? Weapons for PCCS could fill entire books, so which weapons do you want in the game? Are the special rules or systems from PCCS supplements or other Leading Edge Games that you feel are necessary for your use of *OpenCommand*?

For that matter, are there any systems you'd prefer simplified? As it stands, shooting someone and hitting for actual damage will take three shots to resolve; to hit, hit location, and whether the target is incapacitated by the shot. Shotguns will easily add a fourth roll to that, if not more, and laying down supressive fire or detonating explosive weapons needs resolution for each target in their respective ranges.

double8infinity8
armchair insurrectionist
Validated User

Oct 18, 2013 #46

It's great to hear news on this front! I was actually close to asking for an update.

One question: how is task resolution handled in *OpenCommand*? (I'm hoping it's an implementation of the Action/Reaction System, which I personally find among one of my favorite approaches to task-resolution.)

I've got a copy of 'Rhand: Morning Star Missions' on its way, I'm looking forward to comparing the rules with Living Steel 2nd.

As far as what *this person* wants from *OpenCommand*? Hell I'll be honest and say I just really would like to see its existence in the world simply for its inherent value as part of the tapestry of the hobby! I don't know when I'd get a chance to play any time immediately, but I would certainly read it with interest, and no doubt reference it when working on other projects.

Although I would like to use it to play a few table-top skirmishes. For potential actual rpg sessions/campaigns, I'd personally be more interested in seeing melee/hand-to-hand rules for historic settings - so stuff from Sword's Path: Glory and/or Hand-to-Hand Combat System.

Would it be possible to get a preview? I'm particularly interested in the chargen and tht task resolution sections, as well as the final rules for the individual tracking of wounds.

double8infinity8
armchair insurrectionist
Validated User

Oct 18, 2013 #47

> LatwPIAT said:
>
> For that matter, are there any systems you'd prefer simplified?

Actually I meant to add, that the prospect of strategically eliminating/simplifying portions of the rules according to taste/style is also very interesting.

LatwPIAT
Active member
Validated User

Oct 18, 2013 #48

> double8infinity8 said:
>
> It's great to hear news on this front! I was actually close to asking for an update.
>
> One question: how is task resolution handled in *OpenCommand*? (I'm hoping it's an implementation of the Action/Reaction System, which I personally find among one of my favorite approaches to task-resolution.)

As is, I've been working mostly on the PCCS-side of things, so the only task resolutions currently handled are the ones relating to causing grievous harm with firearms and

explosives.

> double8infinity8 said:
>
> Although I would like to use it to play a few table-top skirmishes. For potential actual rpg sessions/ campaigns, I'd personally be more interested in seeing melee/hand-to-hand rules for historic settings - so stuff from Sword's Path: Glory and/or Hand-to-Hand Combat System.

I do have the damage tables for the PCCS H2H system converted to OpenCommand, so that's certainly doable, though it would take some time to write up the rules, and I'd have to figure out how to integrate the systems. PCCS H2H basically assumes you don't want to integrate them, leading to somewhat bizarre situations where, if you're attacked in melee, you can suddenly run twice as fast. Though, of course, this is just an odd consequence of how PCCS models reaction speed; your intelligence is a direct factor in how many times you can act per turn, meaning that the smarter you are, the faster you run... (For the time being, I've kept this for *OpenCommand*, although I'm thinking of replacing it with "general actions" and "gun combat actions", where the former can be spent on anything, and the latter can be spent only to do gun combat things - so being really good at firing your rifle doesn't also make you an Olympic sprinter.)

> double8infinity8 said:
>
> Would it be possible to get a preview? I'm particularly interested in the chargen and tht task resolution sections, as well as the final rules for the individual tracking of wounds.

Well, I did call it *Open*Command, so here's the current state of the rules that aren't just a collection of formulas in a spreadsheet on my laptop. You'll probably be bored; chargen is currently just PCCS-style roll 3d6x5, and the detailed handling of individual wounds is the chapter I haven't written yet. (I also have no idea how to write clear rules. It sounds clear to me, but I've spent the last four months obsessively learning every detail of PCCS by heart. I'm no longer skilled at judging how obtuse the rules are.)

Last edited: Oct 18, 2013

Oct 18, 2013 #49

D

double8infinity8
armchair insurrectionist
Validated User

Right-on! Complete with formulas, well done!

I read the Introduction, and I'm totally on board with the stated intentions.

Along those lines, I've been tinkering-with/digging-at the task resolution system as presented in the Living Steel hardback:

* I think it's an excellent, flexible yet-simple system, but it suffers from poor terminology.

* I think it's adaptable to higher and lesser degrees of granularity, and other dice tricks.

* I think there *may* be benefits in converting it to a roll-over system

So, I've got some very terse notes written which describes the Action/Reaction system, that could be included as a 'Skills and Actions' chapter of *OpenCommand*; would you be interested?

I've got one version that basically re-describes the Action/Reaction system using clearer, explicit terms; and another which simply takes the same mechanical concepts but reciprocates them into a roll-over system. Remember though these are the sparsest of notes, minimal text to get the concept across to an interested reader.

LatwPIAT
Active member
Validated User

Oct 18, 2013 #50

Sure, write up what you got. I have to warn you though, I'm a perfectionist by heart and I love tinkering with things; if I decide to use it for *OpenCommand*, you may not recognize it when I'm done with it.

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[Phoenix Command] Reverse-engineering table 2A/Odds of Hitting *(1 Viewer)*

LatwPIAT · May 26, 2013 · phoenix command

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LatwPIAT
Active member
Validated User

Oct 22, 2013 #51

I had a look at *Living Steel* and its character generation rules, as well as the rules for roleplaying from the PCCS *Advanced Rules Supplement*. They are... not desirable. *Living Steel* has extremely precarious randomized character generation that may enter a non-deterministic infinite loop, and the Advanced Rules give you a point or two of XP per enemy killed, with pretty hefty prices to level up skills.

I do like the Action-Reaction system's core concept though; any skill-test is 3d6-under-16 if you have the required competency, meaning that if you're competent at doing something, you have a 98% chance of succeeding in it. It would just be better if getting competent didn't require you to murder more people than Rambo... (You need to kill over a hundred enemy soldiers to get enough XP to buy a skill up to "experienced professional". Yare yare!)

D

double8infinity8
armchair insurrectionist
Validated User

Oct 22, 2013 #52

Disclaimer: kindof a quick rambling post - I'm kinda in a hurry, but I figured I'd try to dump a few ideas.

> LatwPIAT said:
>
> I do like the Action-Reaction system's core concept though; any skill-test is 3d6-under-16 if you have the required competency, meaning that if you're competent at doing something, you have a 98% chance of succeeding in it.

In agreement with the chargen and advancement issues; also, yeah - Action/Reaction basic core concept - regardless of the specific implementation - is very nice.

I like that the GM just need figure out: under the circumstances, what Skill Level would be needed to perform this action with a high-degree of certainty.

What makes Action-Reaction just a bit unwieldy though, is mostly a matter of a few presentation and terminology quirks, in my opinion.

For intance:

* *that-number-which-the-gm-determines* is not a Named Term in the system, but it should be. (I'm calling it Task Level (TL)).

* *that-final-number-to-be-rolled-equal-to-or-under* is termed Success Roll. (which is wierd, imho - a "success roll" sounds like something you *do*, e.g. the name of a type of roll). So instead I'm calling it the Success Threshold (ST).

* other factors in determining the final odds/"Success Roll", such as the character's acting Skill Level (SL) or the oppositions reactive Skill Level, could/should also have formal terms. (I'm using Acting Skill Level (ASL) and Reacting Skill Level (RSL)).

* a lesser/weak critique, but... nonetheless Base Odds has an unfortunate acronym (at least "BO" is well ingrained in my mind as referring to body odor)... so I've renamed it Base Difficulty.

With all factors named, it then becomes possible to lay it out simply:

Standard Action/Reaction System, summarized:

(constant) Base Number := **16**

Determining the Success Threshold for a Standard Task:
Base Difficulty := Base Number **-** Task Level
Success Threshold := Base Difficulty **+** Acting Skill Level

Determing the Success Threshold for an Opposed Task:
Base Difficulty := Base Number **-** Task Level **-** Reacting Skill Level
Success Threshold := Base Difficulty **+** Acting Skill Level

Now, the above was purely cosmetic changes. However, the following may be of more interest, at least as a curio if nothing else:

If you reciprocate the mechanic so that it is *roll-over* instead of *roll-under*, you can make the Base Number a smaller, potentially variable, number - or dispense with it entirely - further reducing complexity/unwieldiness of the system without actually modifiying/ reducing functionality. Although the subjective arguments over roll-high vs. roll-low system are arguable personal preferences, there is still some tangible benefits from changing to roll-over.

A couple terminology changes from the standard/original *roll-under* system:

Base Number becomes Risk Factor (and instead of equaling a static **16**, it is an optional variable defaulting to **1**).
Success Threshold becomes Error Margin (and instead of the goal being to *roll equal or under* this number, the goal is now to *roll over* it).

Roll-over Action/Reaction System, summarized:

(default) Risk Factor := **1**

Determining the Error Margin for a Standard Task:
Base Difficulty := Risk Factor **+** Task Level
Error Margin := Base Difficulty **-** Acting Skill Level

Determing the Error Margin for an Opposed Task:
Base Difficulty := Risk Factor **+** Task Level **+** Reacting Skill Level
Error Margin := Base Difficulty **-** Acting Skill Level

Roll-over Procedure, distilled:
* The GM determines Task Level according to the following convention: the Task Level of any given action is equal to the estimated Skill Level that would be sufficient for a character to succeed with minimal risk/uncertainty.
* The GM calculates the Base Difficulty, and announces it to the Player.
* The Player calculates and announces the Error Margin, then rolls and sums 3d6 (where 6's == 0 (thus the range is 0-15 (instead of 3-18))). The resulting total *must exceed* the Error Margin for the task to be considered successful.

I've been working on actual commentary/instructional text (which includes Skill Level Rating chart, and Degree of Success and Skill Characteristics) rather than the above terse notes -- but I became distracted when my copy of Torchbearer (and Rhand: Morningstar Missions(!)) arrived in the mail! I'm currently still working on filling-out and cleaning-up the text a bit. If you're still interested, I can have a rough throw-mud-on-wall-worthy bit of a prototype draft posted within a couple days hopefully.

From the basic gist of the notes, what do you think of the roll-over version? How about your thoughts on the alternative terminology?

Also, I was considering calling it the 'Performance Assessment System' vs. 'Action/ Reaction System' - for no other reason than to avoid using the very same name for the resolution system... similar to how your retro-clone is named 'OpenCommand' rather than "Phoenix Command", and for similar reasons. (Though I doubt that the "Action/Reaction System" is trademarked or anything, so I'm not saying it's actually necessary to rename the resolution system.) (Note that similar to **B**ase **O**dds, **A**ction **R**eaction **S**ystem also makes for an unfortunate acronym...)

Last edited: Oct 23, 2013

D

double8infinity8
armchair
insurrectionist
Validated User

The post above described a *roll-over* version of the standard *Action/Reaction System*, which maintained full parity/equivilency of the probabilities, spread and scale of the original system. However it also contained a couple conventions that differed from the original system:

#0: it details the possibility of *dispensing with* the Base Number as an additional factor the GM needs to account for.

#1: as a logical extension of point #0, it also details the possibility of an *adjustable* (rather than static/constant) Base Number, which could be re-termed as Risk Factor.

#2: in order to facilitate point #0, and to make #1 more convenient, it altered the way the dice were read, thus modifying the potential range of the Performance Assessment (from **3-18**, to **0-15**). It achieved this by the simple convention of *ignoring* **6***'s when summing the total*. (Which also has the arguable minor benefit of slightly decreasing parse-time when calculating rolls: you're never adding **6**, and sometimes you're ignoring one or more dice altogether. (Personally, I also like how it enables the range to start from **0**.))

#3: finally, it altered the way the final target number (e.g. the Success Threshold/Error Margin) was acted upon: rather than *meeting* the number, it was necessary to *exceed* it.

So, for reference and for easier comparison, here's the *roll-over* version of Action/Reaction which does not add any "spin" to the original conventions, aside from the reciprocation itself (and the alternate/adjusted terminology):

Roll-over Action/Reaction System, summarized:
(constant) Base Number := **5**

Determining the Success Threshold for a Standard Task:
Base Difficulty := Base Number **+** Task Level
Success Threshold := Base Difficulty **-** Acting Skill Level

Determing the Success Threshold for an Opposed Task:
Base Difficulty := Base Number **+** Task Level **+** Reacting Skill Level
Success Threshold := Base Difficulty **-** Acting Skill Level

Roll-over procedure, distilled:
* The GM determines Task Level according to the following convention: the Task Level of any given action is equal to the estimated Skill Level that would be sufficient for a character to succeed with minimal risk/uncertainty.
* The GM calculates the Base Difficulty, and announces it to the Player.
* The Player calculates and announces the Success Threshold, then rolls and sums 3d6. The resulting total must *meet or exceed* the Success Threshold for the task to be considered successful.

Last edited: Oct 24, 2013

LatwPIAT
Active member
Validated User

Oct 24, 2013 #54

> double8infinity8 said:
>
> Also, I was considering calling it the 'Performance Assessment System' vs. 'Action/Reaction System' - for no other reason than to avoid using the very same name for the resolution system... similar to how your retro-clone is named 'OpenCommand' rather than "Phoenix Command", and for similar reasons. (Though I doubt that the "Action/Reaction System" is trademarked or anything, so I'm not saying it's actually necessary to rename the resolution system.) (Note that similar to **B**ase **O**dds, **A**ction **R**eaction **S**ystem also makes for an unfortunate acronym...)

Heh. I was actually thinking of not calling it anything and just sticking it under the "Skills" heading. Maybe call it a "Skill test" at best. In any case, I do like that you've formalized the terms, which makes the system easier to grasp. I'll probably stick to a roll-under system for the simple reasons that a) I prefer roll-under systems, b) PCCS is a roll-under system, and c) I've already written all of OpenCommand under the assumption it'll be a roll-under system, and going in to change all the tables will be a major chore. In any case, I'll still need to figure out how characters are supposed to put points into skills before I implement it - which necessitates writing a skill list and a chargen system from scratch and then balancing it. Not to mention guidelines and systems for how to use each skill in a meaningful manner (unlike, say, *Living Steel* where Ice Skating was a skill your could dump all your points into and then never get to use...)

Incidentally, I've now written rules for moving around and stances, so the current state of the OpenCommand draft looks like this. Unless I've missed something really major, the only rules from the original PCCS that are missing (and that I consider important enough to transfer) are ones concerning disabling wounds and medical recovery. (And once that's done there's still the overly long list of tables with hit probabilities and ALM modifiers that need to be transcribed, as well as stats for weapons...) but all in all I think it's pretty close to being a playable beta.

D

double8infinity8
armchair insurrectionist
Validated User

Oct 24, 2013 #55

> LatwPIAT said:
>
> Heh. I was actually thinking of not calling it anything and just sticking it under the "Skills" heading. Maybe call it a "Skill test" at best.

Yeah having a distinct name devoted specifically for the resolution system as separate from the rest of the system is entirely unnecessary!

I was just going with the spirit of the rules from LivingSteel, thinking it was thematically appropriate from a 'retro-clone' perspective.

> LatwPIAT said:
>
> I'll probably stick to a roll-under system for the simple reasons that a) I prefer roll-under systems, b) PCCS is a roll-under system, and c) I've already written all of OpenCommand under the assumption it'll be a roll-under system, and going in to change all the tables will be a major chore.

Makes sense.

> LatwPIAT said:
>
> In any case, I'll still need to figure out how characters are supposed to put points into skills before I implement it - which necessitates writing a skill list and a chargen system from scratch and then balancing it. Not to mention guidelines and systems for how to use each skill in a meaningful manner (unlike, say, *Living Steel* where Ice Skating was a skill your could dump all your points into and then never get to use...)
>
> Incidentally, I've now written rules for moving around and stances, so the current state of the OpenCommand draft looks like this. Unless I've missed something really major, the only rules from

Most excellent! And I look forward to seeing what you work out for char gen.

Cheers

Last edited: Oct 24, 2013

D

double8infinity8
armchair insurrectionist
Validated User

Oct 25, 2013 #56

How'd I miss this!

> LatwPIAT said:
>
> ([...] *Living Steel* where Ice Skating was a skill your could dump all your points into and then never get to use...)

Hold up now...

Ice Skating provides *Balance & Footwork* at **2:1** and *Fall Recovery* at **4:1**. (e.g. each 2 Skill Levels in Ice Skating gives 1 Skill Level in B&F, and every 4th level gives 1 level in Fall Recovery.)

(Reference: Section ***2.2***: *Skills*, on the topic of *Professional Skills* (top pg. 25), *Skills Tradeoffs Table* ***(3B)*** (bottom pg. 168))

So that character with all their points in Ice Skating will be (indirectly) applying their honed Ice Skating prowess quite a bit! Which is pretty awesome...

Last edited: Oct 25, 2013

LatwPIAT
Active member
Validated User

Oct 25, 2013 #57

Those rules aren't in 1st ed. *Living Steel*, which is the copy I have access to.

D

double8infinity8

Oct 25, 2013 #58

> LatwPIAT said:
>
> Those rules aren't in 1st ed. *Living Steel*, which is the copy I have access to.

armchair insurrectionist

Validated User

Ah.. that's a bummer! The 2nd ed rules are way better.

I was going to politely/quietly bail outta my offer to write a potential draft of the Skills topic for *OpenCommand*, because with the last couple messages, it looked like maybe it wasn't really something you were looking for at this time.

But if you don't get hold of a copy of 2nd ed. LivingSteel, maybe it'd be useful after all? Let me know, I can post in this thread if you like, or I can create a new one, possibly under Game Design and Development.

LatwPIAT

Active member

Validated User

Oct 27, 2013 #59

I've completed a playable model of the damage, health and recovery system, which means that *OpenCommand* is playable now. The Appendices are missing, so there's no weapon data, but it's trivial to convert between PCCS guns and *OpenCommand* guns. The only values that need to be changed are MA, DC, and ranges.

- To get OpenCommand ranges, convert from PCCS' 2-yard hexes to metres (multiply all ranges in PCCS weapon data sheets by 1.8288).
- Likewise, multiply PCCS MA by 1.8288 to get OpenCommand MA.
- Multiply PCCS DC by 7 to get OpenCommand DC.

And that should be it. You're good to go. If you really, really, *really* want grenades, Concussion Damage is given by: $CD_{OpenCommand} = 10*\ln(CD_{PCCS})$

It's not yet a full clone; disabling Wounds have no mechanical effect yet, and there are several rules that I'd like to include that I haven't yet, such as Ballistic Accuracy, the melee combat system, blunt trauma, more comprehensive rules for performing various actions in combat (I ported the bare bones of what what was strictly necessary) and a skill system to turn it into an actual RPG and not just a tabletop wargame.

So, if you're interested, go get it here: Link! If you want to play it but don't have access to *Phoenix Command*, here's a link to some homebrew weapons I found online that can be run through the equations above.

> pccs.understairs.nl said:
>
> The modifier for an Aim Time of 1 depends on the weapon's weight. Use this formula to calculate it: [...] For the following Aim Time steps, comparison with a similar weapon is usually the best method of "calculation." **No formula could be found that gave acceptable results and fit most weapons published for Phoenix Command.**

http://pccs.understairs.nl/weapondesign.html

This sounds like a challenge.

Plotting the Aim Time ALM bonuses against the Aim Time makes it *very obvious* that they're follow a logarithmic progression. For example, a logarithmic fit of the ALM to Aim Time for the FN FAL gives a R^2-value of 0.9592; pretty accurate. By using my trusty Excel spreadsheet, I was able to get the coefficients for the logarithmic fits of every single weapon in the game. The equation for a logarithic fit in Excel is $y = a*\ln(x)+m$, and a is the value that is most interesting, since understairs.nl already has a formula for m. By

calculating the values of a for every weapon in the game, it became readily apparent that they tended to be the same; 8-9 for rifles, 9-11 for machine guns, around 5 for pistols, and 7-8 for submachine guns. However, a closer analysis of the rifles revealed that heavier rifles tended to have larger a-values - and machine guns tend to be heavier than rifles, while submachine guns are lighter. Plotting the value of a against the weapon's mass (which is conveniently given for each weapon in the PCCS manual) revealed the following correlation:

$a = 2.2702*\ln(\text{weight}) + 3.6705$, $R^2=0.9327$

Where weight is in pounds, since I used the WT values on PCCS' data sheets. Obvious outliers are extremely heavy machine-guns, such as the M2 Browning, which are lower, and scoped sniper rifles such as the FR F2, which are higher (which means you aim faster with a scoped rifle, which isn't too surprising).

Finding m is a bit harder. It seems to follow another logarithmic fit, but that doesn't fit machine guns very well. As always, a polynomial curve fitting will give a good fit eventually, and if I exclude heavy machine guns like the Browming M2, a quadratic fit is extremely accurate for the rest of the data, but will off course not fit the heavy machine guns at all. Fitting just rifles and light to medium machine guns on a logarithmic curve gives another very good fit, but it won't fit the pistols very well...

In any case, the three following equations can all be used to get a value for m:

$m_{all} = -4.213*\ln(\text{weight}) - 11.786$
$m_{\text{no heavy MG}} = 0.0076*(\text{weight})^2 - 0.6645*(\text{weight}) - 14.71$
$m_{\text{rifles + light, medium MG}} = -6.029*\ln(\text{weight}) - 6.899$

Putting it all together, using the last equation, and converting to SI:

$ALM = (2.2702*\ln(\text{mass}/0.4536) + 3.6705 + s)*\ln(\text{actions}) - 6.029*\ln(\text{mass}/0.4536) - 6.899$

Where *s* is a value that is 0 for most weapons and approximately 1.5 for weapons with high-magnification scopes, such as sniper rifles.

Last edited: Oct 27, 2013

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Eukie's Phoenix Command retroclone development

Eukie · Mar 2, 2015 · Tabletop

Eukie
Powered by furious Canadian redheads

Mar 2, 2015 #1

I've mentioned this occasionally on the various SV IRCs, and @open_sketchbook mentioned that a development forum thread might be a good idea, so I'm going to try that. It'll probably fail horribly.

Phoenix Command
The *Phoenix Command Combat System* (PCCS) was a tabletop miniatures wargame released in 1986. Individual soldiers were represented, combat turns represented two-second intervals, and each hex used in the game represented a distance of two yards. The game was notorious for its attempts at detailed realism, which resulted in a lot of book-keeping, mental arithmetic, and long resolution times. The result was a reputation for unplayability, and the game is often mentioned as a warning against the dangers of trying to achieve realism in role-playing games.

The game itself was, as mentioned, more of a miniature wargame, but included rules for using it as an RPG. The Phoenix Command Combat System was also used as the basis for the *Living Steel* RPG, the *Aliens* RPG, the *Lawnmower Man* RPG, and the *Bram Stoker's Dracula* RPG.

The core game included rules for making soldiers shoot other people, grenades, sneaking around, and dying. An *Advanced* supplement was released with roleplaying rules and more detailed rules for the stuff already in the core game. An *Expansion* was released with various odds and ends such as advanced aiming and shooting animals, fish, and dinosaurs. *Advanced Damage Tables* contained pages upon pages of tables for each hit location, allowing you to see just which organs were damage by a shot. Four weapon supplements were released, the *Civilian Weapon Data Supplement* (which detailed civilian and hunting weapons common in the US), the *WWII Weapon Data Supplement* (which contained WWII-era weapons), the *Wild West Weapon Data Supplement* (which contained rules for horses, fast draws, and 19th Century weapons), and the *Special Weapons Supplement* (which detailed White Phosphorous, flamethrowers, garrotes, choke-holds, rubber bullets and bows and crossbows). An Artillery supplement detailed calling for and receiving fire-support from artillery pieces up to and including the Iowa battleship.

There was a *Phoenix Command Hand-to-Hand* standalone game for melee fighting, and a *Phoenix Command Mechanized Combat System* standalone game for commanding individual tanks. The latter received four supplements; *Mechanized Light Vehicles* which contained APCs, IFVs, and the Humvee, *Panzer* with WWII medium tanks, *King Tiger* with WWII heavy tanks, and *Pak Front* with rules for WWII anti-tank guns. These standalone games were compatible with the Phoenix Command Combat System.

Things Eukie likes about Phoenix Command
PCCS is poorly written and badly edited, but after familiarizing myself with the game, I have fallen in love with certain aspects of it.

It has a very detailed ballistics model which closely approximates reality (I checked against US Army Rifle Marksmanship expectations and WWII tank ballistics). Each weapon has a small table of accuracy modifiers corresponding to the time spent aiming. The more time is spent aiming, the more accurate a shot is, following a power law. Kneeling and lying prone increases accuracy and decreases the chance that a character is hit. Weapons that shoot fast bullets are easier to use against moving targets than weapons that shoot slow bullets. Things like that.

It also has a very interesting damage system, where instead of having a HP total that depletes, causing a stubbed toe to be instantly fatal to someone who survived being hit repeatedly in the head with a sword damage simply counts upwards. Then, after some time, you roll the dice to see if your wounds kill you or not. The more damage you have, the sooner you have to roll the dice and the less likely it is that you survive. Receiving First Aid or going to a hospital increases the time you have before you have to roll the dice, and the more likely it is that you survive.

The amount of damage you take is based on three factors; where a bullet hits, how deep a bullet penetrates, and how much energy the bullet deposits in the target. For example, a penetrating shot to the brain is extremely dangerous, while shallow grazes to the arm or leg are comparatively harmless. Very powerful bullets are dangerous even if they hit the extremities, because of the sheer amount of tissue destruction they cause.

Since PCCS has some really cool things I like but is also poorly written and awkward at times, I got it in my head that I'd make a *Phoenix Command* retroclone-ish thing to satisfy my cravings for an RPG with ultra-realistic rules for shooting things.

Firebird Headquarters

MJ12 suggested the name "Firebird Headquarters", which has now become the working name of my RPG project.

External Ballistics

Gunshots approximately follow a Rayleigh Distribution, which has the form:

LaTeX:

$$P(X < r) = 1 - exp(-\frac{1}{2}(\frac{r}{\sigma})^2)$$

For a gunshot fired at a target, r will be the size of the target, while σ will be a measure of the probable drift of the bullet when it reaches the target. The further away the target is, the wider the spread of fired bullets. Twice the distance means twice the spread, for example. It is useful to measure r/σ in multiples of σ. For convenience, the ratio between r and σ can be written as a log-scale. A ratio of 0 means that the probable spread is just as wide as the target. A ratio of 5 means that the probable spread is half the width of the target. A ratio of 10 means that the probable spread is a fourth the width of the target. A ratio of -5 means that the probable spread is twice as wide as the target.

This is convenient in many ways. For example, the effects of range on accuracy can be written as the following table:

Code:

```
Range    Firearms skill modifier
25 m      +10
50 m       +5
75 m       +2
100 m       0
200 m      -5
300 m      -8
400 m     -10
500 m     -12
600 m     -13
700 m     -14
800 m     -15
```

A similar table can be made for target size. A target that is twice the size of a normal target has a +5 modifier to hit. A target that is half the size of a normal target has a -5 modifier to hit. A target that is three times as large has a +8 modifier to hit, etc.

To find the probability of hitting a target at a given accuracy, a table is used. Here's the current incarnation of the to-hit table:

Effective Accuracy	Target Number
28	100
27	99
26	98
25	95
24	92
23	87
22	81
21	74
20	67
19	59
18	52
17	45
16	38
15	33
14	27
13	23
12	19
11	16
10	13
9	11
8	9
7	7
6	6
5	5
4	4
3	3
2	3

1	2
	2
-1	1
-2	1
-3	1
-4	1
-5	1
-6	1
-7	

Take your Firearms skill, add the relevant modifiers, and enter the left column of the table with that number as your Effective Accuracy. Find the corresponding Target Number on the right side of the table. Roll 1d100; if you roll less than or equal to your Target Number, you hit the target.

For example, Kari has a Firearms skill of 15, and is shooting at a standard-sized target that is 75 meters (+2) away from her. Her Effective Accuracy is 15+2=17, so she hits on a roll of 45 or less. Kari's player rolls 37, which means Kari hit the target.

That's the basis of the system for shooting people. I'll try to describe more factors, and what happens to people who are shot, later.

4 2 2 1

Last edited: Mar 3, 2015

Eukie

Powered by furious Canadian redheads

Mar 2, 2015 #2

Automatic Fire, Shotguns, and Fragmentation Grenades

Many modern weapons are capable of automatic fire, wherein a single pull of the trigger fires bursts at a rate of hundreds of bullets per minute. The naive implementation of automatic fire would simply to have the player roll once for every shot their character fired in a burst. However, when combat models two-second intervals, this becomes rather time-consuming to resolve. As an example, the FN FAL has a rate-of-fire of 650-700 rounds per minute. It can fire over 21 bullets in a two-second interval, and rolling twenty-two times against the To-Hit table described above would take a very long time. Other weapons have even higher rates-of-fire; a two-second burst of certain MP5 models would involve 30 rolls to hit, and the Thompson SMG Model 1919 had a cyclic rate of 1500 rpm, and would require 50 rolls. If I want players to be able to get their hands on the M134 Minigun, it would require *two hundred rolls* to resolve a two-second burst. It seems that simply rolling for each bullet fired is not an ideal solution.

The process of firing a set number of bullets, each with a non-zero chance of hitting the target, and counting the number of hits is a Binomial process. There is a set number of events (his) that occur with a set probability (the chance to hit the target), and we're interested in seeing the probability of seeing a number of events occur. For example, if a character fired a three-round burst with a 50% chance of hitting, there would be a 12.5% chance of no bullets hitting, a 37.5% probability of one bullet hitting, a 37.5% chance of two bullets hitting, and a 12.5% chance of three bullets hitting. A table like the following could be used for 1d100 rolls:

Effect	Miss	1 hit	2 hits	3 hits
Roll	01-38	39-50	51-88	89-100

This could be expanded to include all the different Effective Accuracy levels (from -6 to 27). Then we just need a table for two shots, and a table for three shots, and a table for four shots, and a table for five shots and... wait... this is a terrible idea. We need just as many tables as there are burst lengths. Even limiting ourselves to bursts of 12 bullets in length or less, we still need *eleven* tables. This could easily swallow six entire pages of a book, and if you print them out for use at a table, they'll take up a whole lot of a space and will be time-consuming to

leaf through to find just the table you want.

It would be so much easier if we could use just one table for *all* bursts.

A Poisson Process describes a situation where you have an event that occurs randomly over a set period of time, such as the number of calls placed to a call centre, or the number of recruits killed by being kick from horses in the Prussian army. Within that period of time, the event happens on average X times, but it could also occur X+1 times, or X+2 times, or any number of times between 0 and some arbitrarily large number.

This describes bursts of automatic fire well. We have a "period" (the burst), an "event" (hits), and an expected number of events in that time period (the average number of hits). For example, with three shots, each with a 50% chance of hitting, 1.5 shots will hit on average. If the burst is 8 shots long, 4 shots hit on average. A Poisson process is a very similar to a Binomial process, which means a Poisson process can be used - with a minor loss of accuracy - to model a Binomial process:

LaTeX:

$$Binom(n, p, k) \simeq Poisson(n \times p, k)$$

Where n is the number of tests (shots fired), p is the probability of an event happening (the probability of hitting), and k is the number of events (hits). Since the Poisson distribution just has two variables, it can be represented as a two-dimensional table. As an example, here is the row for np = 5; it can represent 10 bullets with a 50% chance of hitting, or 20 bullets with a 25% chance of hitting, or any number of other possibilities.

np\TN	1 hit	2 hits	3 hits	4 hits	5 hits	6 hits	7 hits	8 hits	9 hits	10 hits
5	97-99	88-96	74-87	56-73	39-55	24-38	14-23	8-13	4-7	2-3

Here there's a 1% chance of not hitting anything at all (a roll of 100), while the probability of hitting with 4 to 6 bullets is very high (rolls of 24 to 73). In the event that 10 bullets were fired and we roll 1 on 1d100, the rule would simply be that only 10 bullets can hit. This avoids the silliness of hitting with more bullets than was fired, which can happen in *Phoenix Command*.

I've chosen to end the table at 12, because bursts with automatic weapons tend to be in the 5-7 shot range in the real world, and 12 is a common number of pellets to have in a shotgun shell. The table, in addition to automatic fire, is for use with shotguns and fragmentation grenades. Shotshells (like buckshot) fired from a shotgun is for all intents and purposes just like automatic fire; a number of bullets fired at a target, each with a chance of hitting said target. Fragmentation grenades are also similar; fragments, each with a chance of hitting a target in their way.

To avoid doing the dreaded multiplication, the np-values will also follow a log-scale, just like Effective Accuracy. This has the added advantage of allowing the same modifiers to be used for both Effective Accuracy and np-values. A target that is half the size of a normal target gets a -5 penalty on the log(np) value. A target that is twice the size gets a +5 bonus, a target that is three times the size gets +8, a target that is four times gets +10, etc. Likewise, firing two bullets gives +5 to hit, three bullets gives +8 to hit, four bullets gives +10 to hit, etc.

The difference between trying to hit two targets and trying to hit one target with twice the size is almost trivial; if there are two targets in the area you're shooting into, +5 to the log(np)-value. If there are three targets, +8. If there are four, +10.

As a short example, Kari is firing into an area that gives her attack a base log(np)-value of 11. She's firing at three targets (+8), all of which are twice the normal size (+5), and she's firing eight bullets (+20). This gives her a final log(np)-value of 42. Let's say that this corresponds to a np-value of 5, so we can use the table I gave earlier as an example. Kari's player rolls 1d100 and the dice come up as 65, which means Kari scored 4 hits against her targets. Automatic fire is spread out pretty evenly, so a good rule may be that the first three bullets each hit a target and the fourth hits a random target[1]. Then Kari's player rolls 1d3 to determine where the la bullet went. Kari's player rolls 1, meaning that the fourth bullet hits the first of the three targets.

(More realistically, the first target was hit by the two first bullets, and the second and third target were hit by the third and fourth bullets respectively.)

[1] Alternatively, Kari's player gets to choose where the extra bullet goes. Not very realistic, but it saves having to do that last 1d3 roll to determine where it goes.

4

Eukie
Powered by furious Canadian redheads

Mar 3, 2015 #3

Firing Automatic Fire at the Correct Height

For game-mechanical purposes, firing automatic fire will be treated as a two-step process. The first process is determining whether the shots went high, low, or hit the correct elevation. Then, if the shots hit the correct elevation, the above process is used to determine how many bullets actually hit.

Above I gave the cumulative probability distribution of bullets randomly fired against a circular target. The bullets were randomly distributed in angle and radius, which gave the following equation:

LaTeX:

$$P(X < r) = 1 - exp(-\frac{1}{2}(\frac{r}{\sigma})^2)$$

This is just another way of writing the following integral:

LaTeX:

$$P(|X| < x) = \int_0^{2\pi}\int_{-x}^{x} \frac{1}{2\pi\sigma^2} exp(-\frac{1}{2}(\frac{r}{\sigma})^2) r dr d\sigma$$

Which is in polar form. Here it is in conventional x-y (Cartesian) coordinates:

LaTeX:

$$P(|X| < x_1, |Y| < y_1) = \int_{-x_1}^{x_1}\int_{-y_1}^{y_1} \frac{1}{2\pi\sigma^2} exp(-\frac{1}{2}((\frac{x}{\sigma})^2 + (\frac{y}{\sigma})^2)) dy dx$$

I'm only interested in whether the shooter hit high or low enough, so the final form becomes just:

LaTeX:

$$P(|Y| < y_1) = \int_{-y_1}^{y_1} \frac{1}{\sigma\sqrt{2\pi}} exp(-\frac{1}{2}(\frac{y}{\sigma})^2) dy$$

I don't expect everyone to be able to follow the calculus, but you may notice that this has a very similar form to the equation used above for hitting; specifically, there's a y/σ term, similar to the r/σ term. The value y here represent a target's *height* (whereas r represented the mean radius), and σ represents the standard deviation of the shot in the y-direction. By writing y as a multiple of σ, the ratio y/σ becomes a single value, which I can take the logarithm of. As before, a target that is twice as tall gives a +5 to hit, a target that is three times as tall gives a +8 to hit, a target that is four times as tall gives a +10 to hit, etc.

If I assume that all targets are (frictionless) spheres (in a vacuum), the height y and the radius r become the same, and the same Size-modifiers can be used for both Single Shot table and the Automatic Fire Height table. This is somewhat unrealistic (humans, for example, tend to not be as wide as they are tall), but an acceptable sacrifice in the name of simplicity and expediency.

Hitting the Correct Width

This is a pretty simple process, and much of it was treated in the previous post. Bursts are fired across a number of hexes; for example, a player could decide to sweep their burst across three hexes to hit all the enemies that are in those hexes with one long burst. Or they could choose to keep their burst as narrow as possible to try to maximize the chance of hitting their intended target with the full burst.

The base probability of hitting a target with a burst that's one hex wide is about 12%, corresponding to the chance of hitting a 23 cm wide target. This corresponds, roughly, to the size of a head and arm peeking out from behind cover while holding a rifle. This base probability gives a log(np) value as described above. Then various factors are taken into account; firing a burst that's twice as wide (2 hexes) gives a -5 modifier as it's less likely that a bullet strikes the 23 cm wide target. A burst that's three times as wide (3 hexes) gives a +8 modifier. A burst that's half as wide (half a hex) gives a +5 modifier, etc. A target that's twice as wide, 46 cm, gives the corresponding +5 modifier to hit, as mentioned in the previous post.

You may remember the table in my first post which give the target number for hitting a single target based on the Effective Accuracy. Here is the same, expanded for both single shots and hitting the correct elevation with bursts of automatic fire:

Effective Accuracy	Single Shot TN	Autofire Elevation TN
28	100	100
27	99	99
26	98	97
25	95	94
24	92	90
23	87	85
22	81	81
21	74	76
20	67	68
19	59	61
18	52	56
17	45	48
16	38	43
15	33	38
14	27	34
13	23	30
12	19	25

11	16	22
10	13	20
9	11	17
8	9	15
7	7	13
6	6	11
5	5	10
4	4	9
3	3	8
2	3	7
1	2	6
	2	5
-1	1	4
-2	1	4
-3	1	3
-4	1	3
-5	1	2
-6	1	2
-7		2
-9		1
-12		1
-16		1
-24		

Within the following spoiler block are the first five columns of the table for hitting targets within an arc, as mentioned in the second post:

Spoiler: The Autofire Width Table

Let's go back to Kari, who is shooting at her enemies. She has a Firearms skill of 15, and she's firing an eight-bullet burst at three normal-sized targets spread across three hexes 75 meters (+2) away, for an Effective Accuracy of 17. The target number for automatic fire at this accuracy is 48. Kari's player rolls a 51, which means she's above the target number, and her shot misses. When Kari has an opportunity to fire her weapon again, she tries for another burst. Kari's player rolls a 46, meaning Kari fired at the correct elevation. She hasn't hit her targets just yet though.

Kari sweeps her burst across three hexes. I haven't cleaned up the tables and rounded all the values just yet, but let's use the 2.8 row for this, corresponding to an Index (the log(np) values) of 13. She's firing eight bullets (+15) and there are three targets (+8). Her shots are fired with an Index-value of 13+15+8 = 26. This gives a Target Number of 41 to hit with at least one bullet, a Target Number of 10 to hit with at least two bullets, etc.

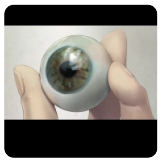
Kari's player is very lucky and rolls 09 on a 1d100. That's lower than the Target Number for 2 hits, but not lower than the Target Number for three hits. This means that two of the bullets Kari fired hit their targets. The GM is

kind, and Kari's player gets to pick which two enemies got hit.

Next time I might try to cover what happens when someone actually gets hits.

Last edited: Mar 3, 2015

2



Hassam

Mar 3, 2015 #4

Say, are you going to computerize all of this?

Eukie

Powered by furious Canadian redheads

Mar 3, 2015 #5

> Hassam said:
>
> Say, are you going to computerize all of this?

I've considered it. One approach is to make tools that handle things like randomly distributing shots with autofire, or determining the extent of damage when a bullet hits. The other approach is simply to make a computer game. The former I could probably do, the latter is a project for an entire team with far more skill and experience than I have.

Getting Shot

When someone are shot, it is necessary to determine where the bullet strikes. Some areas of the body are more critical than others. Shots to the heart or brain are extremely deadly. Shots that graze the arms and legs are far less dangerous. Shots to the spine or knee may not be instantly fatal, but run the risk of giving the target a disabling injury as they become unable to move. A shot to the hand may not kill, but it severely hampers the ability of the combatant to fight back. Shots that break bones are immensely painful, increasing the chance that the target passes out from the pain and shock.

Here's an example hit-location table with 23 different locations:

01	Head Glance
02-03	Forehead
04	Eye - Nose
05-06	Mouth
07-09	Arm Glance
10-11	Shoulder
12	Upper Arm - Flesh
13	Upper Arm - Bone
14	Forearm - Flesh
15	Forearm - Bone
16	Hand
17	Weapon

18-20	Chest Glance
21-24	Chest
25	Base of Neck
26	Heart
27-31	Spine
32-43	Abdomen
44-57	Pelvis
58-61	Leg Glance
62-78	Thigh - Flesh
79-83	Thigh - Bone
84-100	Shin/Foot

This is a somewhat compacted version of the full table, which has 41 distinct locations from the front and 24 from the side. Having multiple versions of the hit-location table allows people who want different levels of fidelity to their model to be satisfied. Some might be satisfied with Head/Body/Arms/Legs and rules for critical hits, while others may want to have the full set of 65 hit locations.

In large-scale battles, the Head/Body/Arms/Legs table could be useful for nameless NPCs whose task is to be killed by the players, even though the game normally uses a more detailed table. The most compact table I have is the "Average" table, which has one row that averages the damage from all other rows; it's particularly useful if someone are point-blank with an exploding grenade, which can result in *hundreds* of fragments hitting them. Instead of rolling *two hundred times* for hit locations, use the Average table and multiply the total damage by 200.

Taking Damage

The damage from a gunshot wound depends on three factors; where it hits, how deep it penetrates, and how much destruction it causes in what it hits. The first is covered by the hit-location tables above. The latter two are covered by the weapon's stats. A weapon has a Penetration value (PEN), and a Damage Class (DC).

In PCCS, after you'd determined the hit location, you'd cross-index the hit location and the Damage Class of the weapon. This would give a table-within-a-table, where you'd enter the PEN to find the damage the bullet wound caused. Then you'd divide the damage by the character's Health to find the damage they actually took, and add it to all damage they'd previously received.

This has certain problems. Not only does it encourage GMs to not allow characters with Health characteristics other than 1 and 10, you have to constantly add up numbers whenever a character receives damage. Damage-values in PCCS could be three-digit, meaning you'd often have to do three-digit addition (not to mention three-digit long division!) to find out how much damage a character has taken.

I may be writing up posts with calculus in them because I think that's fun and calculate the hit-probabilities, but I'm doing this on a spreadsheet, and I have access to a calculator and Wolfram Alpha. I do *not* want to have to do three-digit long division in the middle of a game.

The damage to a given location is given by both PEN and DC, but the Damage Class is a simple multiplier. To put it in very simple terms, for a given PEN and hit location, the damage from a bullet with Damage Class 2 is twice the damage from a bullet with Damage Class 1, the damage from a bullet with Damage Class 3 is thrice the damage from a bullet with DC 1, the damage from a DC 4 bullet is four times DC 1, etc. In short, the final damage from a *single* gunshot can be given by:

LaTeX:

$$Damage = \frac{f(PEN, HitLocation) \times DamageClass}{Health}$$

Using logarithms, I can remove all the multiplication:

log(Damage) = log(f(PEN,hit location)) + log(DC) - log(Health)

Here, log(f(PEN,hit location)) is a function of two variables. This makes it easy to put in a single table. I can have every column be a given penetration depth, and each row be a hit location. Then, when someone are shot, they add the log(DC) and subtract their own log(Health) from the damage.

Here is a simplified version of what a hit-location table looks like. This one is missing all the details on broken bones, concussions, severed arteries and the alike, but close inspection may reveal some details. For example, note that the damage for a shot to the heart takes a drastic turn from -15 to +77 as PEN increases from 0.5 to 1.0. This is because the bullet penetrates the chest wall at a penetration depth of 0.1 to 0.5, then enters the heart as it travels beyond a depth of 0.5.

Spoiler: Hit Location Table

Consider the following situation. Kari is firing her service-issue pistol at an enemy. She's using a Browning Hi-Power, which has a PEN of 2 and a log(DC) of 21. Her target is slightly tougher than average, with a log(Health) value of -1. Kari's player rolls to hit and succeeds, then rolls for a hit-location. Kari's player rolls 09 on 1d100, a Shoulder Glance hit. Moving along the Arm Glance row until she finds the correct PEN, Kari's player sees that the bullet has penetrated fully, so she can use the rightmost cell; -1. This gives Kari's target a log(damage) of -1 (for the location) -1 (for a Healthy target) + 21 (the weapon's Damage Class) = 19.

Kari fires again, and hits once more. Kari's player rolls 25, a hit to the Base of Neck location. The bullet achieves a penetration-depth of 2, which is 17 log(damage). Had the Hi-Power penetrated deeper, it would have caused a far more impressive 51 log(damage). In any case, the log(damage) of this wound is 17-1+21 = 37.

Kari fires a third time and as before she hits. Kari's player rolls 25, a hit to the Heart location. With PEN 2, the bullet penetrates deep and strikes the heart for 78 log(damage). This gives the target a wound with a log(damage) of 78-1+21 = 98.

The target now has three wounds; a 19-point one, a 37-point one, and a 98-point one. I haven't covered the rules for dying yet, but while the 19-point wound and the 37-point wounds are not too hard to survive, the 98-point wound is almost instantly fatal. Kari's foe drops like a rock.

1

Last edited: Mar 4, 2015

open_sketch
#1 Transgender Pansexual Witch Bandit Wolf Girl
BEST SELLING AUTHOR
Commission Artist
Location: Ottawa
Pronouns: She/Her/Whatever

Mar 3, 2015 #6

Making a phone app that could do the heavy mathematical lifting is probably the best way to handle a game like this. One of the rules of thumb I have for making my own games is that I never multiply or divide except by two or ten under any circumstances. This stems primarily from my inability to do math.

2

Eukie
Powered by furious Canadian redheads

Mar 22, 2015 #7

Suppressing Fire

Suppressing fire is the use of several shots in rapid succession to discourage one's enemy from shooting back. This is usually helped a lot by the use of machine guns, which have high rates of fire. In the RPGs I've seen that even bother modelling suppressing fire, most seemed to treat it as a distinct form of attack. In GURPS, it's a slight variation upon a Wait-and-Attack where anyone moving into a designated area risks being shot. Likewise,

in latter editions of *Shadowrun* and *Eclipse Phase*, it's a special form of attack that works much the same way as in GURPS.

In real life, *all* fire is suppressing fire. The fear-inducing effects of having lots of bullet hit near you does not distinguish between shots intended to hit, and shots intended to keep your head down. If you shoot a lot of people and narrowly miss, they're probably not going to want to stick their heads out even if you didn't intend to suppress them.

How then, to model this?

Well, luckily the US Armed Forces have done extensive research into the suppressing effects of rifle and machine gun fire. Among the documents I found were The Identification of Objective Relationships Between Small Arms Fire Characteristics and Effectiveness of Suppressive Fire and the The Fort Sill Fire Suppression Symposium Report. Both of these describe mathematical models based on life-fire experiments on US soldiers (!!), in order to quantify the suppressive effects of rifle and machine machine gun fire.

To summarise the findings of both documents, and some personal evaluations of what they say, suppression is a function of the following factors:

- The General Technical score of the soldier being shot at
- The experience of the soldier
- The distance the shots miss
- The number of shots that miss
- How scary the shots are

The scariness of the shots is particularly interesting. The *most* scary kind of shot is completely silent. However, if the shot isn't completely silent, scariness grows with the loudness of the weapon. The first document I linked actually recommends fitting weapons with noise-making devices in order to increase the effectiveness of suppressing fire. (In my vivid imagination, I always imagine this as M16 rifles with fog horns in place of the grenade launcher.) All else being equal, the scariness also scales with the muzzle energy of the weapon. This makes sense; the more energy a bullet has, the more noise it makes when it strikes something, and the more visually impressive its impact is.

The net result of combining all of these factors is an equation of the form:

LaTeX:

$$SI = 9.0197 \times \ln(\frac{mv^2}{620}) - 9.9 \times \ln(missdistance) + 9.0197 \times ln(bullets) - 2.8 \times (GTscore) - 0.85 \times (Monthsincombat) + 74$$

Where SI is the "suppression index", m is the mass of the bullet, v is the muzzle velocity of the bullet, "miss distance" is the distance from the target the bullet impacts, "bullets" is the number of bullets that were fired in a burst, "GT score" is the target's General Technical score, and "Months in combat" is the number of months of time the soldier has been in active combat deployment. The SI corresponds to the following effects:

Code:

```
SI        Effect
100       "Take cover as best I could, but wouldn't be able to observe or fire on the enemy at all. "
90        "Take cover as best I could and would be able to observe the enemy occasionally, but wouldn't be able to fir
80        "Take cover as best I could and would be able to observe the enemy continuously but wouldn't be able to fire
59        "Take cover as best I could, and would be able to observe the enemy occasionally and fire at the enemy occas
34        "Take cover as best I could, and would be able to observe the enemy continually and fire at the enemy occasi
17        "Take cover as best I could, but would be able to observe I the enemy continually and place continuous fire
0         "Would continue doing what I had been doing before the incoming fire and wouldn't worry about getting better
```

The damage of a bullet impact in FBHQ is already proportional to the logarithm of energy, so the first factor for

suppression can be accounted for as a multiple of damage. The modifiers for distance are *also* logarithmic, so miss-distance is also a simple multiplication factor. Likewise, the autofire rules mentioned above also already measure the number of bullets fired in a burst on a logarithmic scale.

This gives:

LaTeX:

$$SI = 0.4 \times DC + 0.8 \times (BurstLengthALM) - 0.72 \times (ScatterNumber) - 0.28 \times (GTScore) - 0.85 \times (Monthsincombat) + 76$$

These aren't the most convenient factors. Ideally they'd be on the order of 2, 5, 10, ½, ⅕, or U+2152, like open_sketchbook suggested. However, dividing through by 0.8 and rounding a bit, this gives:

SI = ½DC + Burst Length ALM - Scatter Number - ⅓ GT Score - Months in combat +95

Which is a pretty neat equation, don't you think?

TODO: More suppression stuff.

1

Last edited: Mar 22, 2015

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Mar 22, 2015 #8

Instead of creating this Suppression Index, why not simplify a bit by giving individual soldiers some kind of discipline stat (which you let you build in ideas like soldiers being jittery from previous attacks, exhaustion, etc for REALISM!) and do a degree of success thing?

Also, to simplify, you could probably attach a general Scariness value to individual weapons representing an abstraction of the muzzle velocity, mass of round, and other factors (for example, you could add a modifier for particularly notorious weapons; the *bzzzip* of an MG42 has a certain je ne sais quoi where suppression is concerned.)

So you might get an equation vaguely like...

Scariness x BurstLength / Scatter = SI

And then you'd compare it to the target's Discipline Under Fire stat. So like, you might produce a value like "12" from a burst, and my hypertactical operator is 9, so 3 degrees of success corresponding to the number 3 slot on your table.

Probably save some page real estate... and sanity, while being able to easily factor in some functions not necessarily modeled by your equation.

2

Eukie
Powered by furious Canadian redheads

May 1, 2015 #9

Aiming Guns

At it's heart, *Firebird Headquarters* is a *Phoenix Command* retroclone. At the end of the day, even though I tinker with things, I'm making a game to capture the essence of another game. The place where I personally feel this is most apparent is in how guns are aimed.

All weapons in FBHQ have a small table that lists the accuracy modifiers for time spent aiming at a target. A

table might look something like this:

Aim Time	Accuracy
1	-23
2	-13
3	-10
4	-8
5	-6
6	-5
7	-4
8	-3
9	-2
10	-1

If a character spends 1 action aiming at their target, they get a -23 Accuracy Modifier. If they spend two actions, this decreases to -13. After three, to -10. If they spend as much time as possible aiming, 10 actions, they suffer only a -1 penalty.

The Aim Time 1 accuracy modifier is given by the equation:

LaTeX:

$$Acc_1 = -14.116 \times (mass \times 2.2)^{0.219}$$

Where 'mass' is the weapon mass in kilograms. This shows that the heavier a gun is, the more difficult it is to quickly bring it to point at a target.

Aiming a gun at something is a form of pointing, and so it is possible to apply the psychophysiological laws that describe pointing in humans to the act of pointing a gun at a target. Pointing in humans follows Fitts's Law, which reveals a power-law relationship between pointing time and the size of the area pointed at. When aiming a gun, the size of the area pointed at is the accuracy, so Fitts's Law can be rearranged to show a power-law relationship between time spent aiming and accuracy.

I used an Excel spreadsheet to fit a power curve to the aim time accuracies for every single weapon in the *Phoenix Command* core book. This revealed the that, indeed, a power law described the situation fairly well. This gave rise to the following equations:

LaTeX:

$$Acc_t = Acc_1 - 5 \times \log(e^{(k \times \ln(t) - 0.75)}) k = -0.34 \times ln(mass \times 2.2) - 0.2179$$

Where t is the aim time.

Here's the calculated table for a Beretta 92:

Aim Time	Accuracy
1	-17
2	-10
3	-9
4	-8
5	-7

Here's the M16A1 table again:

1	-23
2	-13
3	-10
4	-8
5	-6
6	-5
7	-4
8	-3
9	-2
10	-1

And here's the FN MAG:

Aim Time	Accuracy
1	-29
2	-17
3	-13
4	-10
5	-8
6	-6
7	-5
8	-4
9	-2
10	-1
11	zero
12	zero
13	1

14	2

As you can see, pistols are quicker to aim than rifles, but also don't aim as well. The longer sight radius of the M16 gives it a good accuracy when properly aimed. The heavy FN MAG machine gun has a hefty -29 penalty when just swung into position, but is not particularly much harder to aim than the M16, and the longer sight radius gives it an even greater maximum accuracy.

3

Eukie
Powered by furious Canadian redheads

Aug 1, 2015 — Last edited: May 1, 2015 — #10

I've been working on and off on this project. @open_sketchbook has been helpful in motiving me to write clear and readable rules. Which is sort of why I'm making this post; here's a link to the rules-in-progress document I've been working on, and here's a link to the complete set of damage tables.

Mind, the damage tables aren't complete! I still need to add shaded areas (they represent disabling injuries) to the Rear and Prone damage tables, as well as notes on when an injury causes legs to break, or when there's an AHC% hit chance of taking AV damage from a major artery being severed by the bullet, and such effects. Not to mention tables for hit location hit probabilities for various angles. There's no "arm" or "head" locations on the prone table, for example, because it's possible to just use the Front table ones. Though it may be more convenient to have the Prone table give them anyway, for easier reference. I'm not sure.

These are also the 'master' damage tables, so they're rather extensive and require a 1d1000 for rolling. The Front table, for example, has 41 distinct hit locations, 4 general hit locations (Head, Arms, Body, Legs), and 1 that averages every single table. Where data was available from Phoenix Command, the penetration depths have been modelled at a 0.1 PEN resolution, from 0.1 to 15.

The sample table I gave above has 23 hit locations, and uses 0.1 resolution only from 0.1 to 0.5, then uses a 0.5 resolution up to 3, and then goes with just whole numbers. As you might imagine, this makes the damage tables much smaller. Not everyone needs to know whether it was the Stomach, Stomach Rib, Stomach Kidney, or Stomach Spleen location that was hit; merely "Stomach" or "Lower Chest" will suffice.

Anyway, this should give you an idea of what I've been working on and let you read some of what I've written. If you want to know what this actually is supposed to play like, I ran a very short game of *Phoenix Command* in the Quest forum earlier this summer. It's here.

3

Eukie
Powered by furious Canadian redheads

Aug 23, 2015 — #11

I've run into an issue.

Effective accuracy is generally calculated as Skill+modifiers. However, very often I have rules that interact with the Size modifier as separate from Effective Accuracy, or Effective Accuracy without taking Size into account. For example, shotguns have a Pattern Accuracy modifier that represents the increased chance to hit because the pellets have a wide spread. However, this wide spread only helps when it's bigger than the target, so Effective Accuracy becomes Skill + modifiers + max(Pattern Accuracy modifier, Size modifier).

Also, sometimes weapons have an upper limit to their accuracy termed the "Ballistic Accuracy" that represents the inherent limitations of the ammunition and the gun. No matter how well you aim, the bullet will drift some. In these cases, Effective Accuracy is calculated as min(skill+modifiers, Ballistic Accuracy)+Size.

As you might imagine, the case Effective Accuracy = min(skill+modifiers, Ballistic Accuracy) + max(Pattern Accuracy modifier, Size modifier) can occur.

Quite often the system will interact with Effective Accuracy-before-Size-modifier, and I should give it a proper name so I can refer to it. However, I just can't figure out what to call it.

Any ideas for what I should call Effective Accuracy-before-Size and Effective Accuracy-after-Size-and-other-effects-like-Pattern Accuracy?

2

Raumgespenst

Aug 23, 2015 #12

> Eukie said:
>
> I've run into an issue.
>
> Effective accuracy is generally calculated as Skill+modifiers. However, very often I have rules that interact with the Size modifier as separate from Effective Accuracy, or Effective Accuracy without taking Size into
>
> Click to expand...

How about you call the first theoretical accuracy and the second practical accuracy?

Eukie
Powered by furious Canadian redheads

Feb 20, 2016 #13

Suppressing Fire, Part 2

The notes above towards how to model suppressive fire aren't complete, and given how important suppressive fire is, I wanted to have a good *and* easy-to-use model of it. I've therefore spent an evening pouring over the problem again, trying to find a good model. So, here goes:

It is assumed in at least one US suppression model that the chance of *not* being suppressed after having been exposed to many things that cause suppression is simply the chance to *not* have been suppressed by *any* of them. In other words, there are no aggregate effects. There's a function which conveniently has this property, and it can already be used to measure the suppressive effects of explosive shells from artillery fire (and wouldn't it be convenient if both bullets and explosive weapons used the same equations?) - the exponential distribution:

LaTeX:

$$P(S) = 1 - e^{-\lambda x}$$

For some variable *x*, and some constant λ, which for n events takes the form

LaTeX:

$$P(S)_n = 1 - (1 - P(S))^n$$

LaTeX:

$$P(S)_n = 1 - (1 - 1 + e^{-\lambda x})^n = 1 - e^{-\lambda n x}$$

First is relating the Suppression Index *SI* to *x*. Luckily, we know that *n* and *x* are to the same power, and SI is already a function of *n*, see above. Hence:

LaTeX:

$$x = e^{SI/9.0197}$$

Now, the model I've looked at has 7 suppressive states with their own SI thresholds. When a weapon has a SI of exactly a threshold, there's a 50% chance it causes the target to enter into that suppressive state. So, for each state, we simply set λ such that the P(S) is 50% when the SI equals the threshold.

Still though. Six states. And what do those states even mean? How do I quantify "Take cover as best I could, and would be able to observe the enemy occasionally and fire at the enemy occasionally." as distinct from "Take cover as best I could, and would be able to observe the enemy continually and fire at the enemy occasionally."?

Instead of tangling with this, I've decided to take a page from a slightly simpler model of suppression. The CARMONETTE model has three states; not suppressed, Pinned Down, and Partially Neutralized. Soldiers that are Pinned Down can't move and have their accuracy degraded (not further specified in the document I have). Soldiers that are Partially Neutralized have 50% degraded weapon accuracy, doubled aiming time, slowed movement, and slower target acquisition. I think this is a fairly decent abstraction. I also wish to include a fourth state; Fully Suppressed, which is when the soldiers are unable to even fire back for fear of exposing themselves (the existence of this state of suppression is well-supported in literature).

Cross-referencing the the ASARS Battle Model and the table I posted months ago, I've decided to put the thresholds at:

Partially Neutralized: 2
Pinned Down: 3
Fully Suppressed: 4

Alternatively I could have Partially Neutralized at 1 and possibly Pinned Down at 2. Fitting these things requires mashing together several suppression models that don't always correspond. I also need to do some final fitting; the model I have used is for 18 bullets being fired, so I need to divide everything by 18:

LaTeX:

$$P(FS) = 1 - e^{-\frac{e^{0.11 \times SI}}{10461 \times 18}}$$

LaTeX:

$$P(Pin) = 1 - e^{-\frac{e^{0.11 \times SI}}{1014 \times 18}}$$

LaTeX:

$$P(PN) = 1 - e^{-\frac{e^{0.11 \times SI}}{63 \times 18}}$$

Suppression is often taken to last an average of 10-15 seconds and follow exponential decay, that is:

LaTeX:

P(NS|S) = 1-e^{- \frac{ \Delta t}{\mu}

Where P(NS|S) is the probability of leaving suppression given that the soldier is suppressed, in the interval Δt, and μ is the average time of suppression. For 10 seconds, this gives a probability of leaving suppression of 5%. So each turn a soldier is suppressed, they roll 1d20 and on a 1 they stop being suppressed.

I might expand this to involve a gradual decay of suppression, where the soldier moves down on the scale, from Fully Suppressed all the way own to Not Suppressed, so they don't jump straight from being unable to shoot to being ready to leap into enemy fire and take names. In any case though, this is a fully workable system for handling suppressive fire in infantry combat. Pretty cool, huh?

2

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For all readers and writers

After much ado, our new tagging system is here and being rolled out to the userbase. Read more here!

Phoenix Command, Turn by Turn (SOCOM Quest)

Eukie · Jun 5, 2015 · Tactics

Created at	Index progress	Watchers	Recent readers
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This is purely a combat scenario designed to show people how combat in the infamous Phoenix...

1 2 Next ›

Eukie
Powered by furious Canadian redheads

Jun 5, 2015 #1

This is purely a combat scenario designed to show people how combat in the infamous Phoenix Command works. It's a short scenario where you're a special forces operator trying to survive terrorists an attack by terrorists who've broken into your apartment to kill you. Anyone who wishes to play will suggest and vote on your course of action. I'll play the terrorists.

BLUFOR: US SOCOM
Player: Open to all participants
Goal: disable all REDFOR terrorists OR escape through the door on the bottom edge of the map
Strength: 1 US SOCOM operator, unarmed
Setup: Small bathroom

Attributes
Strength (STR): 13
Agility (AGL): 16
Health (HLT): 10
Intelligence (INT): 13
Willpower (WIL): 15

Base Speed (BS): 3
Maximum Speed (MS): 8
Intelligence Skill Factor (ISL): 27

Skills
Gun Combat Skill Level (GCSL): 8

Capability
Actions per phase: 11
Shot Accuracy Level (SAL): 14
Knockout Value (KV): 120
Damage Total: 0
Wounds: (currently none)

Equipment
Weapons: Beretta M92F ~~unarmed~~
Armour: Pyjamas (PF = 0)
2x Beretta magazines, 15 rounds of 9x19mm Parabellum JHP each

REDFOR: Generic Terrorists
Player: Eukie
Goal: Eliminate BLUFOR
Strength: 2 terrorists
Setup: Hall

Capability
Actions per phase: 8/8
SAL: 10/10
KV: 20/20
DT: 2/23

Equipment
Weapons: SPAS-12/MP5
Armour: ???

The Playing Field

Hexes are 2 yards (1.83 m) across.

Note: there is a loaded gun in the potted plant nearest the small bathroom
Note: there is an unloaded shotgun hidden under the double bed

Beretta M92F
Damage Class: 5
Penetration: 2.3
Reload Time: 4

Rate of Fire: Automatic, 1 shot/Fire action
Capacity: 15 shots

Aim Time ALM:
1: -17
2: -11
3: -10
4: -9
5: -8
6: -7

Ammo left:
Magazine 1: XXXXXXXXXX
Magazine 2: XXXXXXXXXXXXXX
Magazine 3: XXXXXXXXXXXXXX

Eukie
Powered by furious Canadian redheads

~~Last edited: Jun 8, 2015~~

Jun 5, 2015 #2

How To Play

No explicit options for what to do will be provided. Players will submit proposals for courses of actions, and other players may then vote on which proposal to take. Each player has one vote, and players are assumed to vote for their own proposals unless otherwise specified.

Each turn is 2 seconds long, during which you have 11 actions. BLUFOR and REDFOR move simultaneously.

Actions

Movement

You can move a number of hexes equal to your Maximum Speed each turn. Movement costs depend on which hex you enter relative to your own. Forward movement is fast, while backward movement is slow.

Each time you move a hex, you can turn *one* hexside. You can also use an actions to turn *up to two* hexsides. For example, if you want to move one hex forwards, then spin around to face the direction you came, this takes 2 actions; 1 to move forwards and turn 1 hexside, plus 1 to turn 2 hexsides.

Stances

Your stance affects 3 things:

- Lower stances have smaller Sizes. Size is an Accuracy Level Modifier to attacks against you
- Lower stances are slower, and increase the cost of movement
- Lower stances are more stable, and grant an Accuracy Level Modifier

It costs actions to move between stances, as indicated on the diagram.

Aiming At Stuff
You need to aim at stuff to shoot it. The longer you aim, the better. You can choose whether you want to use the sights or not:

Using the sights is more accurate, but slower

Pop out from behind cover
Sighted fire: 2 actions
Hip fire: 1 action
When popping out from behind cover, you have Size 0.

Fall back into cover
1 action

Aim
Choose a target within a 60 degree (1 hexside) cone centered on your view. Increase your Aim Time against that target by +1. If you switch targets, Aim Time is reset.

Shooting
You can also shoot!

Fire
As Aim, but also pulls the trigger once. This generally makes the weapon fire a bullet. Aim Time is reset to 2 or lower.

Other
Open a door silently: 3 actions
Kick open a door: 2 actions
Take a gun from a flower pot: 4 actions
Pull shotgun bag from under bed: 3 actions
Pick up shotgun: 4 actions
Unsafety your gun: 1 action
Stuff a magazine into your pyjamas pockets: 6 actions
Take a magazine from your pyjamas pockets: 4 actions
Throw a small object: 2 actions

You can also ask for things not mentioned here, and receive an estimate on how long it will take.

Hitting Things

At Range

Range (hexes)	ALM
C	53

	38
1	33
2	28
3	25
4	23
5	22
6	20
7	19
8	18
9	17
10	17
11	16
12	15

The "C" range bracket is "contact", and is unlikely to occur.

Target Numbers for Hitting

EAL	Single Shot TN
28	100
27	99
26	98
25	95
24	92
23	87
22	81
21	74
20	67
19	59
18	52

17	45
16	38
15	33
14	27
13	23
12	19
11	16
10	13
9	11
8	9
7	7
6	6
5	5
4	4
3	3
2	3
1	2
	2
-1	1
-2	1
-3	1
-4	1
-5	1
-6	1

Jun 5, 2015

#3

~~Last edited: Jun 7, 2015~~

Eukie

Powered by furious Canadian redheads

Initial Situation, T+0 Seconds

You were just roused from a dazy midnight toilet visit by the sound of two men picking the lock of your front door and moving into your hallway. How will you proceed?

Last edited: Jun 5, 2015

The Laurent

Councillor

Pronouns: They/Them

Jun 5, 2015 #4

Hmm, not sure yet, not enough details, but my gut (IE, probably wrong) says go for the loaded gun, shoot one of the terrorists, or otherwise use it to suppress them, and then try to get out of there? But maybe they'd predict that?

Eukie, know this is probably outside the parameters of the combat and such, but are the phone lines working? Do we have a cell-phone in the house?

Edit: Apologies for posting before the placeholders.

Havocfett

Be, So It Is

Content Promotion

Pronouns: He/Him

Jun 5, 2015 #5

Move forward out of bathroom, rotating one hex-side per move to get us to the potted plant as efficiently as possible, crouch, grab grun? Not sure where all the doorways are, though.

Eukie

Powered by furious Canadian redheads

Jun 5, 2015 #6

> The Laurent said:
>
> Eukie, know this is probably outside the parameters of the combat and such, but are the phone lines working? Do we have a cell-phone in the house?

That's outside the parameters of the situation. Assume you have intuitive knowledge that the phone lines are cut and that any cellphone you may have is being jammed.

> Havocfett said:
>
> Move forward out of bathroom, rotating one hex-side per move to get us to the potted plant as efficiently as possible, crouch, grab grun? Not sure where all the doorways are, though.

I've marked the doorways in green and purple here. The purple line is the doorway you have to escape through.

The Laurent

Councillor

Pronouns: They/Them

Jun 5, 2015 #7

Thank you. So, hrm, sorry for all the questions, but do we have shotgun ammunition here? Not sure if that's the best move, of course, but just want to see if there's a possibility to go for the heavier firepower. Though loading it will take time, as indicated.

Eukie
Powered by furious Canadian redheads

Jun 5, 2015 #8

@The Laurent : The shotgun is in a bag that also contains a box of 25 shells, so yes, it has ammunition.

TearfulDevil
Location: Toronto, Ontario, Canada, Earth
Pronouns: She/They

Jun 5, 2015 #9

What's "the infamous"?

Eukie
Powered by furious Canadian redheads

Jun 5, 2015 #10

That was supposed to read "the infamous Phoenix Command", with a link to a picture illustrating its infamy.

Eukie
Powered by furious Canadian redheads

Jun 6, 2015 #11

I seem not to have captured much attention with this, so I'm going to move forwards in the hopes that once you have an actual gun in your hands, it'll be a little more exciting. Havocfett is the only one to have submitted an actual course of action, and with his own vote, it wins.

Situation, T+2 seconds

BLUFOR Actions
Move forwards: 1
Open door silently: 3
Move forwards and turn: 1
Move forwards and turn: 1
Crouch: 1
Take gun (and ammo) from flower pot: 4

REDFOR Actions
You cannot see what the terrorists are doing.

Report
You advance fast yet carefully out of the small bathroom and into the living room. You turn around the divider and kneel in front of the potted plant. You grab the stalk and pull,

revealing that it's sitting in very shallow soil. Inside the flowerpot is a gun and some ammo, which you grab. As you're kneeling, you hear two sets of heavy footsteps - the terrorists appear to be outside your bedroom door (Location A). With a gun in one hand and two reloads in the other, you plan your next course of action...

You have a gun!
You've hidden a gun in a potted plant in your living room for just this kind of situation. What kind of gun is it?

[ ] Beretta M92F, with two spare magazines holding 15 shots of jacketed hollow point bullets each, for a total of 45 shots. (Damage Class 5, Penetration 2.3, automatic double action, Reload Time 4, Aim Time 1: -17 ALM, Aim Time 6: -7 ALM)
[ ] S&W M29, in .44 Magnum, with a 4 inch barrel. The gun is loaded in five of the six chambers with JHP rounds, and you have two speed loaders with six bullets each, for a total of 17 shots. (DC 7, PEN 3.3, revolving double action*, Reload Time 7, Aim Time 1: -18 ALM, Aim Time 6: -7 ALM)
[ ] SIG Sauer P220 with a silencer and two spare magazines holding 9 shots of subsonic JHP each, for a total of 27 shots. (DC 2, PEN 1.2, automatic double action, Reload Time 5, Aim Time 1: -16 ALM, Aim Time 6: -7 ALM)

* Double action gives a -1 Aim Time penalty because of the heavy trigger pull. You can cock the hammer in advance to avoid this, which takes 1 action.

You're still not safe
Come up with a plan of action for what to do next. Note that while you're holding the magazines/speed-loaders in one hand, you're holding your gun in only one hand, which gives a -4 penalty to your Shot Accuracy Level. If you pick one of the pistols, you'll need to spend 1 action disabling the safety before you can fire. If you pick the revolver, you can choose to cock the hammer now for 1 action, or fire it double action later.

Last edited: Jun 6, 2015

Havocfett
Be, So It Is
Content Promotion
Pronouns: He/Him

Jun 6, 2015 #12

[X] Beretta M92F, with two spare magazines holding 15 shots of jacketed hollow point bullets each, for a total of 45 shots. (Damage Class 5, Penetration 2.3, automatic double action, Reload Time 4, Aim Time 1: -17 ALM, Aim Time 6: -7 ALM)

Hmm, how's the cover from that cabinet or the couch? I'm thinking we want to sneak past when they enter the bedroom.

bluekun
I draw stuff (Commissions Slots Open)
Location: Home

Jun 6, 2015 #13

[X] SIG Sauer P220 with a silencer and two spare magazines holding 9 shots of subsonic JHP each, for a total of 27 shots. (DC 2, PEN 1.2, automatic double action, Reload Time 5, Aim Time 1: -16 ALM, Aim Time 6: -7 ALM)

-Open door silently
-Move forward and turn, enter bathroom
-Hide in shower stall.

Lets see if this works?

Eukie
Powered by furious Canadian redheads

Jun 6, 2015 #14

> Havocfett said:
>
> Hmm, how's the cover from that cabinet or the couch? I'm thinking we want to sneak past when they enter the bedroom.

Most furniture and the walls will reduce bullet penetration by 1. The doors are quite thin, and will only block .3 penetration. If you hide inside, for example, a closet, it'll offer about the same protection as a door. The glass of the shower stall in the bathroom is not particularly though, and blocks .1 PEN.

open_sketch
#1 Transgender Pansexual Witch Bandit Wolf Girl
BEST SELLING AUTHOR
Commission Artist
Location: Ottawa
Pronouns: She/Her/Whatever

Jun 6, 2015 #15

[X] Beretta M92F, with two spare magazines holding 15 shots of jacketed hollow point bullets each, for a total of 45 shots. (Damage Class 5, Penetration 2.3, automatic double action, Reload Time 4, Aim Time 1: -17 ALM, Aim Time 6: -7 ALM)

Eukie
Powered by furious Canadian redheads

Jun 6, 2015 #16

> bluekun said:
>
> -Open door silently
> -Move forward and turn, enter bathroom
> -Hide in shower stall.

I'm unclear on which door, and which bathroom you mean. Could you use this map?

Ba: large bathroom
Be: bedroom
G: guestroom
H: hallway
K: kitchen and living room
S: bathroom with shower

1: Door, near terrorists
2: Door, open
3: Door, closed
4: Door, closed (exit point)
5: Door, closed

The Laurent

Councillor

Pronouns: They/Them

Jun 6, 2015 #17

Not sure on actions, but no silencer is needed for sure, and the S&W takes too long to reload.

[X] Beretta M92F, with two spare magazines holding 15 shots of jacketed hollow point bullets each, for a total of 45 shots. (Damage Class 5, Penetration 2.3, automatic double action, Reload Time 4, Aim Time 1: -17 ALM, Aim Time 6: -7 ALM)

---

bluekun

I draw stuff (Commissions Slots Open)

Location: Home

Jun 7, 2015 #18

Sorry, I meant G2 but I misread the thing.

BiopunkOtrera

Traitor to her Class

Councillor

Pronouns: She/Her

Jun 7, 2015 #19

[x] Beretta M92F, with two spare magazines holding 15 shots of jacketed hollow point bullets each, for a total of 45 shots. (Damage Class 5, Penetration 2.3, automatic double action, Reload Time 4, Aim Time 1: -17 ALM, Aim Time 6: -7 ALM)

Turn towards the door and fire on the terrorists through it, now they've given away their location.

Eukie

Powered by furious Canadian redheads

Jun 7, 2015 #20

People seem to be going for the Beretta. I'll update the character sheet with it. It's subject to change, but for now it will allow you a better idea of how to plan your actions.

> FBH said:
>
> Turn towards the door and fire on the terrorists through it, now they've given away their location.

digs out the supplement with Blind Fire rules

Firing at a target you can't actually see is somewhat difficult. First you roll to see if you hit the hex it's in, with a +15 target size modifier. Then you roll to see if you hit something *in* the hex. For a Size 7 target (standing human), there's a 13% chance of hitting. Also, if the target has moved away from the hex, you don't hit anything.

1

Havocfett
Be, So It Is
Content Promotion
Pronouns: He/Him

Jun 7, 2015 #21

Shooting the dudes blindly is a terrible idea. Hmm

Door to the main hall is closed?

Eukie
Powered by furious Canadian redheads

Jun 7, 2015 #22

> Havocfett said:
>
> Door to the main hall is closed?

Yes. You are a meticulous person who closes all the doors behind you when you go to the toilet. The only door you're aware of that is open is door 2.

1

Havocfett
Be, So It Is
Content Promotion
Pronouns: He/Him

Jun 7, 2015 #23

How quiet is our movement, roughly?

Edit: I'm thinking we want to creep up to the door, as quietly as we can. We def don't want to blind-fire through it, since that sacrifices our element of surprise for literally no gain.

Last edited: Jun 7, 2015

Eukie
Powered by furious Canadian redheads

Jun 7, 2015 #24

> Havocfett said:
>
> How quiet is our movement, roughly?
>
> Edit: I'm thinking we want to creep up to the door, as quietly as we can. We def don't want to blind-fire through it, since that sacrifices our element of surprise for literally no gain.

You're in an urban house and indoors, near a busy street, with a wall inbetween you. If you more 2-3 hexes per turn, there's a 50% chance (for each terrorist), that they'll hear you if you move into their hex (though this makes it difficult to have a wall between you), otherwise they're basically deaf to your presence (1% chance to hear at 1 hexes). If you run any faster than 3 hexes per turn, there's a 100% chance they'll hear you if you move within 1 hex of them, and 82% chance at 2 hexes, and 8% chance at 3 hexes, 3% at 4 hexes, and no chance at 5 hexes and out.

As mentioned, this is with a wall between you. Additionally, if they become aware you're not in your bed, they may become more alert. On the other hand, if they start firing their guns, for any reason, they'll lose some of their hearing ability.

I wasn't actually intending to pull out the hearing rules for this one, but you asked so nicely. ^_^

Havocfett
Be, So It Is
Content Promotion
Pronouns: He/Him

Jun 7, 2015 #25

Aah, OK. Thanks.

Edit: Voting to move 3 hexes towards the door, including rotating (Which I think moves us two hexes towards it)

Last edited: Jun 7, 2015

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For all readers and writers

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Phoenix Command, Turn by Turn (SOCOM Quest)

Eukie · Jun 5, 2015 · Tactics

Prev 1 2

Revlid
blob of bugs
Location: England

Jun 7, 2015 #26

> Havocfett said:
>
> Aah, OK. Thanks.
>
> Edit: Voting to move 3 hexes towards the door, including rotating (Which I think moves us two hexes towards it)

This sounds good. Very tactical. I agree with what this man said.

Eukie
Powered by furious Canadian redheads

Jun 7, 2015 #27

Situation, T+4 Seconds

BLUFOR Actions
Stand up: 1
Turn 2 hex-sides clockwise: 1
Move forwards: 1
Move forwards: 1
Move forwards: 1
Unsafety gun: 1
Cock hammer: 1

REDFOR Actions
You cannot see what the terrorists are doing. They are firing weapons.

Report

You stand up and spin around, moving fast but silently towards the door. As you've just made your first steps, you hear the sounds of shots; both the hellish typewriter ticking of a submachine gun, and two roars of a 12-gauge shotgun. They're not firing at you though - they're coming from the master bedroom. As you step up to the door, you can hear well through the door. The submachine gun - you think it's an MP5 of some kind - continues its burst. You hear the sound of a mattress being torn to pieces by 9x19mm Parabellum. You hear a crack, followed by a tinkle, as your bedroom window shatters from a shotgun blast. Three more shotgun blasts sound out, discernible over the continuous infernal cackling of the MP5. 12 gauge, six shots in under two seconds? It's either a highly skilled shotgunner, or more likely, a semi-auto shotgun like the SPAS-12. It should have about one shell left in the tube now. The MP5 should be over half empty. You disable the safety of your M92F, cock the hammer, and consider your next move...

Next
Come up with a course of action for what to do. Right now they're occupied with perforating your mattress, but soon they'll discover they're just shooting your duvet and

Do our pajamas have pockets to put our ammo into? It occurs to me that we really don't want that aim penalty from holding stuff in one hand.

Jun 7, 2015 #28
Havocfett
Be, So It Is
Content Promotion
Pronouns: He/Him

Eukie
Powered by furious Canadian redheads

Jun 7, 2015 #29

come looking for you. Luckily, you know where they are, and they don't know where you are. How are you going to proceed?

@Havocfett Yes. You're holding both magazines in the same hand, so you can stuff both into your pockets with the same motion, requiring just 6 actions. When you've done this, it'll take 4 actions to retrieve one (or both) magazines. It may be worth keeping in mind that while shooting is fast, reloading is slow.

Last edited: Jun 9, 2015

Havocfett
Be, So It Is
Content Promotion
Pronouns: He/Him

Jun 7, 2015 #30

Hmm, how does listening work once we open this door?

Acatalepsy
Firewall Proxy
Location: The Diamond Age

Jun 7, 2015 #31

Can we (1) open the door, checking towards the south door and shooting whoever is there if there's someone right there and then (2) move forward past the door to our bedroom and check the room to the right and then (3) turn around to shoot them when they come out of our room?

BiopunkOtrera
Traitor to her Class
Councillor
Pronouns: She/Her

Jun 7, 2015 #32

[x] open the door, if there's someone there, shoot them. If not, move forward silently and ambush them as they exit the bedroom.

bluekun
I draw stuff (Commissions Slots Open)
Location: Home

Jun 7, 2015 #33

[X] Open door silently, observe their actions. Wait for right moment, then ambush them.

Eukie
Powered by furious Canadian redheads

Jun 7, 2015 #34

@Havocfett I'm going to treat it as there being no wall between you and the adjacent room (and the bedroom, if the door is open, which it probably is) for the purposes of determining sound levels. This'll increase the sound level by +4. At the same time, the terrorists have -6 for having fired shots recently, and +2 because they're alerted to the fact you may be awake. This zeroes out, so the guidelines I described above still apply.

@Acatalepsy You can open the door (3), point your gun to the south (1), and then either shoot or, face west again (1), advanced three hexes (3) to search the living room and kitchen (automatic), then turn to face east (2), and still have an action left to shoot with.

@FBH I interpret your desired course of action as: Opening the door (3), and then either shooting terrorists (8 times), or advancing west (1), then aiming for the doorway (1) and spending any remaining actions to shoot the terrorists (you can squeeze off 6 shots, all with Aim Time 2) as they step out of your bedroom. Is this satisfactory/what you want to do?

@bluekun The course of action that seems to fit with what you propose the most is: Open door (3), adopt a firing position around the doorframe (hip fire: 1, sighted fire: 2, pick one), aim for the doorway (1), wait until both terrorists are in view and then shooting with any remaining actions (up to 6, all with Aim Time 2).

Havocfett
Be, So It Is
Content Promotion
Pronouns: He/Him

Jun 7, 2015 #35

Wait, they still don't detect us auto if we're not in their hex? That changes everything! We can open the door, silently duck into the bathroom south of us and still have move left.

bluekun
I draw stuff (Commissions Slots Open)
Location: Home

Jun 8, 2015 #36

True that, but which one would be the better idea to approach this eh?

> Eukie said:
>
> @bluekun The course of action that seems to fit with what you propose the most is: Open door (3), adopt a firing position around the doorframe (hip fire: 1, sighted fire: 2, pick one), aim for the doorway (1), wait until both terrorists are in view and then shooting with any remaining actions (up to 6, all with Aim Time 2).

Yeah, that about sums it up. And I choose Sighted Fire for this bit.

BiopunkOtrera
Traitor to her Class
Councillor
Pronouns: She/Her

Jun 8, 2015 #37

> Eukie said:
>
> @FBH I interpret your desired course of action as: Opening the door (3), and then either shooting terrorists (8 times), or advancing west (1), then aiming for the doorway (1) and spending any remaining actions to shoot the terrorists (you can squeeze off 6 shots, all with Aim Time 2) as they step out of your bedroom. Is this satisfactory/what you want to do?

Yes. That's it.

Edit: We probably shouldn't stay in the doorway. There's a reason they call it the fatal funnel.

invinoveritas

Jun 8, 2015 #38

[X] Open door silently, observe their actions. Wait for right moment, then ambush them.

Eukie
Powered by furious Canadian redheads

Jun 8, 2015 #39

Situation, T+6 Seconds

BLUFOR Actions
Open door: 3
Adopt sighted fire firing position around doorframe: 2
Pin doorway: 1
Fire (Tango One): 1 (SAL: 14, -4 one-handed, -11 AT2, +7 target size, +33 range = 39, TN 100, hit)
Fire (Tango One): 1 (SAL: 14, -4 one-handed, -11 AT2, +7 target size, +33 range = 39, TN 100, hit)
Fire (Tango Two): 1 (SAL: 14, -4 one-handed, -11 AT2, +7 target size, +33 range = 39, TN 100, hit)
Fire (Tango Two): 1 (SAL: 14, -4 one-handed, -11 AT2, +7 target size, +33 range = 39, TN 100, hit)
Fire (Tango Two): 1 (SAL: 14, -4 one-handed, -11 AT2, +7 target size, +33 range = 39, TN 100, hit)

REDFOR Actions

Tango One (Shotgun)
Turn 2 hex-sides clockwise: 1
Advance forwards and turn counterclockwise: 1
Fire shotgun: 1 (SAL 10, -6 hip fire, -23 aim time 1, +33 range = 14, TN 27, rolled 29, narrow miss)
Advance oblique south-east: 3/4

Tango Two (MP5)
Turn 2 hexsides counterclockwise: 1
Turn 1 hexside counterclockwise: 1
Advance forwards and turn clockwise: 1
Turn 2 hexsides counterclockwise: 1
Turn 1 hexside counterclockwise: 1
Fire full-auto: 1 (SAL: 10, -6 hip fire, -20 AT1, +33 range = 17, TN 48, rolled 79, miss)

Report

There's silence for half a second, during which you push open the door to the main hall. As you lean out from behind the doorframe, aiming your pistol at the doorway, you hear rubber soles twist against wooden floor. A and a man in a black assault overall holding a SPAS-12 shotgun runs out of your bedroom and turns to face you. You aim at him. With a flick of the wrist he levels the shotgun at you from his hip, and there's a deafening roar as it fires - and misses. A cluster of pellets fly past you, and the other terrorist steps into view, scanning the kitchen.

You double-tap at the first terrorist, hitting him in the left shoulder and leg. He starts shuffling to the your left. As the terrorist with the MP5 turns towards you and lets a burst rip, you return fire. His burst goes wild, climbing up to hit the ceiling, as you hit him three times. Once in the left shoulder, once in the pelvis, and once in the left foot. He falls forwards with a loud 'thump'.

You've got one of them, but the other is still lurking in the corner of your eye. His shotgun is empty - you've counted the shots - but he has a handgun in his holster. Your next course of action is...

Technical

- Tango One is hit, random hit location roll is 092, which hits the Left Shoulder Socket. It penetrates to a depth of 2.3, into but not through the humerus. The bullet is slowed significantly, doing only 1 damage. The pain and shock of the bone breaking adds 15 shock damage.
- Tango One is hit, random hit location roll is 792, which hits the Left Thigh - Bone. It penetrates to a depth of 2.3, and lodges in the femur. The bullet is slowed significantly, doing only 1 damage. The pain and shock of the bone breaking adds 20 shock damage.
- Tango Two is hit, random hit location roll is 090, which is also in the Left Shoulder Socket. The effect is the same as above; 1 damage and 15 shock damage.
- Tango Two is hit, random hit location roll is 523, which hits the Hip - Intestines - Pelvis hit location. It over-penetrates and fractures his pelvis, but it slowed significantly in the process, for 21 damage and 20 shock damage from the pain.
- Tango Two is hit, random hit location roll is 993, which hits the Left Foot. It

penetrates to a depth of 2.3, breaking several of the metatarsal bones, and comes to a rest near the sole. The foot is not particularly lethal to be hit in; only 1 damage because the bullet is slowed, but an additional 40 shock points from broken bones.

Tango One has a Knockout Value of 20. With 2 Physical Damage and 35 Shock Damage, the total damage is higher than his KV. With a roll of 43, he manages to avoid being knocked unconscious. In addition, he has a broken thigh bone, adding +12 to all his movement costs, and a fractured shoulder socket, disabling his use of his left arm.

Tango Two also has a Knockout Value of 20. With 23 Physical Damage and 75 Shock Damage, the total damage is over 98, over three times his KV. With a roll of 42, Tango Two is Stunned, unable to take any actions. With a roll of 7, it will last for 23 minutes. In addition, he has a broken foot and a broken pelvis, both of which impair his ability to walk, and a broken shoulder, disabling the use of his left arm. He will die of his wounds if he doesn't receive medical aid within 11 hours.

BiopunkOtrera
Traitor to her Class
Councillor
Pronouns: She/Her

Jun 8, 2015 #40

Shoot Tango 1 again until he goes down.

Havocfett
Be, So It Is
Content Promotion
Pronouns: He/Him

Jun 8, 2015 #41

Shoot tango 1 again, yeah.

bluekun
I draw stuff (Commissions Slots Open)
Location: Home

Jun 9, 2015 #42

[X] Shoot Tango 1 again to be sure.

Eukie
Powered by furious Canadian redheads

Jun 9, 2015 #43

Situation, T+8 Seconds

BLUFOR Actions
Fire: 1 (SAL: 14, -4 one-handed, -11 AT2, +7 target size, +33 range = 39, TN 100, hit)
Fire: 1 (SAL: 14, -4 one-handed, -11 AT2, +7 target size, +33 range = 39, TN 100, hit)
Fire: 1 (SAL: 14, -4 one-handed, -11 AT2, +7 target size, +33 range = 39, TN 100, hit)

REDFOR Actions
Tango One (Shotgun):
Complete movement: 1
Draw gun from belt holster: 1/3 (interrupted)

Tango Two (MP5)
Stunned

Report

You swing your gun to Tango One and pull the trigger as fast as you can. You manage a tight group to his right pelvis-area; the first shot tears at his outer thigh, the muzzle climb raises your second shot to his lower chest, and then you bring the Beretta down again and hit him in the pelvis. He collapses instantly, before he can draw his pistol. With both your attackers unconscious, and you without a single scratch, you've survived. Shame about your apartment though...

Technical

- Tango One is hit, random hit location roll is 525, which is a Right Leg Glance. It overpenetrates, dealing the full damage of it's damage class, 9 physical damage.
- Tango One is hit, random hit location roll is 338, which is a hit to the Lowest Chest - Liver - Spine. The 2.3 penetration does not penetrate Tango One's bulletproof vest, but the force of impact causes 3 damage.
- Tango One is hit, random hit location roll is 457, which is a hit to the Pelvis. It

overpenetrates, barely, and the bullet is significantly slowed. It inflicts 21 physical damage. The pelvis is fractured, causing 20 shock damage from the pain.

Tango One has 35 physical damage total, and received 20 shock damage, for a total of 55; over twice his KV. He rolls 8, failing spectacularly, and is knocked out cold. He'll be unconscious for four minutes.

Cleanup

Congratulations, you successfully survive the encounter by disabling both terrorists! You gather their weapons and restrain both of them. You find your cell phone and call the police and SOCOM. After about a quarter of an hour, two ambulances and some police cars turn up, as well as some officers from SOCOM, who debrief you. With access to a modern hospital, both terrorists survive without doubt, and make full recoveries in secure federal prisons.

2

Havocfett
Be, So It Is
Content Promotion
Pronouns: He/Him

Jun 9, 2015 #44

That's *Phoenix Command*; hope you enjoyed playing!

Great success!

Last edited: Jun 9, 2015

BiopunkOtrera
Traitor to her Class
Councillor
Pronouns: She/Her

Jun 9, 2015 #45

Are we going to get a continuing adventure? Cause I'll keep voting if you do.

bluekun
I draw stuff (Commissions Slots Open)
Location: Home

Jun 9, 2015 #46

For Great Success and Justice! That was the fastest quest I have ever seen completed.

Eukie
Powered by furious Canadian redheads

Jun 10, 2015 #47

> FBH said:
>
> Are we going to get a continuing adventure? Cause I'll keep voting if you do.

I'm trying to think of a scenario to run that explores some aspects of the game that you didn't get to experience this time around. Maybe run it as a play-by-post RPG/wargame in

the Roleplaying subforum, with players handling a character each. Or just playing this incredibly badass SOCOM Tier 0 Operator taking on enemies by themselves with voted actions. I'll also need to find a map.

You know, let you actually get your hands on a weapon that can fire in bursts, or your own shotgun, give you access to hand grenades, the likes.

> bluekun said:
>
> For Great Success and Justice! That was the fastest quest I have ever seen completed.

It was a little faster than I expected; the extremely close range meant you never missed, which brought down enemies quickly. I was expecting more desperate shots across rooms, which would have made the rounds draw out a bit as you traded shots.

Prev 1 2

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PHOENIX COMMAND™

Hand-to-Hand Combat System

LEADING EDGE GAMES

INTRODUCTION

The **Phoenix Command Hand-to-Hand Combat System** has been created to provide a truly realistic and highly playable set of rules for melee combat, featuring a wide variety of weapons and possible settings. It is fully compatible with the **Phoenix Command Small Arms Combat Systems (PCCS)**, of course, and has been designed with the same attention to detail and the same level of complexity as that game. As with PCCS, these rules are based on careful study of the actual mechanics of movement and combat.

Players need not be familiar with the Phoenix Command line, however. This product stands entirely on its own, and all the necessary rules and information have been provided. PCCS players will find that some sections are familiar, and that many of the same concepts are used in both games.

The entire spectrum of hand-to-hand weapons is represented, from swords to bayonets to common household items, allowing players to use **Phoenix Command Hand-to-Hand** in virtually any setting. It can be used as a stand-alone combat system, plugged into most role-playing settings, or may be used as a supplement to PCCS. So whether you are interested in medieval combat, modern and post-modern warfare, police settings, or more offbeat games, **Phoenix Command Hand-to-Hand** will take you into the heart of the battle.

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PCCS STATUS SHEET

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1

THE CHARACTER

As discussed in the Introduction, the **Phoenix Command Hand-to-Hand Combat System** can be used as a stand-alone game or as the combat system of a role-playing campaign. The following rules for generating Characters are provided to cover both applications; players should simply use those rules which apply to their own setting.

1.1

CHARACTERISTICS

Each Character or combatant has certain innate characteristics which help to determine performance on the battlefield. These **Characteristics** are defined by numbers which represent the person's physical and mental capabilities; Strength, Will, Health, and Agility. Other Characteristics which are specific to role-playing are not dealt with here, as they do not directly affect melee combat.

Figure 1 (on page 3) is a sample Status Sheet. The four Characteristics are located near the top of the left column. Definitions of the Characteristics are as follows.

Strength (STR): The overall physical strength of the Character. An untrained person with STR 10 can dead lift about 200 pounds, one with STR 14 can dead lift about 250 pounds, and one with STR 18 can dead lift about 400 pounds.

Will (WIL): Resolve and willpower, affecting courage in the face of danger and resistance to the pain of wounds.

Health (HLT): Physical health and the ability to recover from wounds.

Agility (AGI): Physical coordination and speed.

The value of each Characteristic will typically be between 3 and 18. The larger the value, the greater the person's capability, as indicated on the following table.

Characteristic Value	Description
18	Exceptional
16	Excellent
14	Good
12	Above Average
10	Average
8	Below Average
6	Poor
3	Extremely Poor

"That looks pretty fatal. I think you have to return to the Character Generation section."

One Character to another

To use this system with another game, convert the other game's Characteristics to the 3 to 18 scale using the preceding guidelines. For a stand-alone game, simply determine the value of each Characteristic by totaling the roll of 3 six-sided dice. Alternatively, the **Pregenerated Troop Data** of Section 1.6 can be used for quick pick-up games, or to provide opponents for scenarios.

1.2

GENERATING A CHARACTER

To generate a Character, determine each value on the Status Sheet using the following step-by-step procedure. General explanations of these values are given here; the full details are found in the Chapters that follow. (For PCCS players, steps that are different from PCCS have been marked with an asterisk). A blank Status Sheet has been provided at the end of this book, while **Figure 1** is an example of a completed sheet. There are several differences between the two sheets; Figure 1 lists only the values necessary for Hand-to-Hand uses, while the blank Status Sheet also includes everything necessary for PCCS play.

Step 1 Characteristics

Separately determine the values of each of the **Characteristics** found in the upper left-hand corner of the Status Sheet by totaling the roll of 3 six-sided dice.

Each Characteristic = Total of 3 six-sided dice

"If you hit them hard enough, they can't complain."

Field Marshall Paul Maul

Step 2 Skill Level

The Character's ability in melee combat is represented by his **Hand-to-Hand Combat Skill Level** and his **Unarmed Combat Skill Level**. These are established using the following guidelines.

Skill Levels range from 0 to 20, with Level 0 being someone with no training whatsoever. An average soldier in an average army is assumed to be 3rd to 4th Skill Level with his primary weapon, while highly trained elite troops are 5th to 7th. Outstanding members of elite units might be 9th to 12th, and only truly exceptional people would be of higher level. 20th Skill Level is the maximum possible. For medieval soldiers, the primary skill is Hand-to-Hand Combat with melee weapons. For modern soldiers, it is Gun Combat with modern small arms. Medieval soldiers are assumed to have an Unarmed Combat Skill Level equal to one-half their Hand-to-Hand Combat Skill Level (rounded down), while modern soldiers have Skill Levels in both Hand-to-Hand and Unarmed Combat of one-half their Gun Combat Skill Level (again, rounded down).

Those using other games should use their game's method of generating Skill Levels and acquiring experience. Just adjust that system to this scale for determining your Skill Levels.

Player or Referee chooses the Hand-to-Hand and Unarmed Combat Skill Levels

***Step 3 Encumbrance**

Now the **Encumbrance** is determined. This is the total weight of armor, clothing, weapons, and equipment carried into combat. The greater the Encumbrance, the slower the Character. Backpacks and other non-combat equipment can sometimes be dropped before entering combat; if so, they should not be included in this weight. The setting of the game will determine if this occurs.

To find the Encumbrance of a Character, total the weights (in pounds) of all equipment being carried. A list of weapons and equipment is in Section 1.3, and on the **Weapon Data Table (1)**.

"Don't worry about a thing. Just hold up that shield and charge. We'll be right behind you."

Trebor

The **Weapon Data Table (1)** is located at the back of this supplement, and is separated into two sections; Archaic and Modern. Over 50 weapons appear on this table. Select the appropriate weapon or weapons from **Table 1**, and record their weights and those of all armor and equipment carried on the Status Sheet. If armor is being worn, record the Armor Class and Blunt Protection Factor (BPF) (Section 1.4) in the space provided.

Record equipment weights, Armor Class, and BPF
Encumbrance = Total weight carried into combat

Step 4 Base and Maximum Speeds

Next, find the Character's **Base** and **Maximum Speeds**. These depend on his Strength, Agility, and Encumbrance. Base Speed represents overall mobility, while Maximum Speed is the Character's top running speed in Hexes per Impulse (Section 2.5).

Find the Base Speed by cross-indexing the Strength (STR) Characteristic (Step 1) with the Encumbrance (Step 3) on the **Base Speed Table (2A)**. Record the Base Speed on the Status Sheet. As an example, a Character with Strength 13 and an Encumbrance of 20 pounds has a Base Speed of 2.5. Encumbrance should be rounded off to the nearest column.

Now cross-index the Base Speed with the Character's Agility (AGI) Characteristic (Step 1) on the **Maximum Speed Table (2B)**, to find the Maximum Speed. For example, a Character with Agility 10 and a Base Speed of 2.5 has a Maximum Speed of 5.

FIGURE 1 HAND-TO-HAND COMBAT SAMPLE STATUS SHEET

Name: Donovan

Characteristics

Strength	STR	13
Will	WIL	10
Health	HLT	9
Agility	AGI	10
Base Speed		2.5
Maximum Speed	MS	5
Hand-to-Hand Skill Level		3
Combat Efficiency	CE	9
AGI Skill Factor	ASF	19
Combat Actions		
Hand-to-Hand	CA	5
Damage Bonus	DB	1.5

COMBAT ACTIONS PER IMPULSE

	Impulse			
	1	2	3	4
Hand-to-Hand	2	1	1	1

Knockout Value KV 15

Body Armor		BPF	Armor Class	Weight
Helm:	–	0	NO	–
Visor:	–	0	NO	–
Body:	Clothing	0	NO	2.0
Arms:	Clothing	0	NO	1.0
Legs:	Clothing	0	NO	2.0

Equipment

M-16A1 Rifle	8.0
Sling	.4
Fighting Harness	.6
Four Magazines	4.0
Two Magazine Pouches	.4
M26A2 Grenade	1.0
K-Bar Knife	.6

Encumbrance = 20.0

Physical Status

PD Total:

Disabling Injuries:

Ammunition:

HAND-TO-HAND WEAPON DATA

Weapon	Weap Speed (WS)	Weap Class (WC)	Attack Level (AL)	Action Costs				Impact Damage		Range 2' hex
				Parry	Set	Strike	Recvr	Cutting (IDc)	Stabbing (IDs)	
M-16A1 Rifle	1.9	-1	2	1	2	1	1	(6)+3	(6)+2	2+
K-Bar Knife	2.8	+2	5	1	1	1	1	(3)+1	(3)	1

In this way, the Character's overall strength and quickness are factored in with the weight he is carrying to determine how quickly and easily he can move.

Base Speed = Cross-index Strength (Step 1) and Encumbrance (Step 3) on Table 2A
Maximum Speed = Cross-index Agility (Step 1) and Base Speed on Table 2B

***Step 5 Combat Effectiveness**

The Character's **Combat Effectiveness (CE)** is now determined. This is based on his Skill Level, and measures his efficiency in battle and his knowledge of melee tactics. The greater the CE, the greater his expertise.

Enter the Character's Hand-to-Hand Combat Skill Level on the **Combat Effectiveness Table (2C)** to find the Character's CE. This should now be recorded on the Status Sheet. Note that the CE rises rapidly through the first few Levels, and then moves up more slowly. This represents the rapid improvement in performance possible for beginners. (The CE is similar to the Skill Accuracy Level in PCCS).

CE = Found on Table 2C, opposite the Hand-to-Hand Combat Skill Level

"You can fool some of the people all of the time, and all of the people some of the time... and that should be enough to get you through."

Excerpt, King's Men Political Manual

***Step 6 Agility Skill Factor**

The **Agility Skill Factor** is now established. This is the sum of the Agility Characteristic (AGI) and the Combat Effectiveness (CE) (Step 5). Record it on the Status Sheet.

Agility Skill Factor = Agility Characteristic + CE (Step 5)

***Step 7 Combat Actions and Damage Bonus**

The Character's **Combat Actions (CA)** and **Damage Bonus (DB)** measure the speed and power with which he can maneuver and fight. Both ability and Encumbrance are factors in determining the Combat Actions and Damage Bonus.

The time required to perform any act, such as drawing a weapon or parrying, is measured in **Action Counts** (Section 2.2). These Action Counts are the relative cost, in time, to perform a given activity. The Character's Combat Actions are the number of Action Counts he can perform during each 2-second Phase. The Damage Bonus represents the additional force with which a particularly fast, powerful, or skilled Character strikes. The Impact Damage of a Strike (Step 9) is multiplied by the Damage Bonus before determining its effect, as explained in Section 3.5.

To find the Combat Actions and Damage Bonus, go to the **Combat Actions Table (2D)** and cross-index the Maximum Speed (Step 4) with the Agility Skill Factor (Step 6). Record the Combat Actions and Damage Bonus on the Status Sheet.

The number of Actions a Character can perform in a 1/2 second Impulse should also be determined now. The **Combat Actions per Impulse Table (2E)** is consulted, and the number of Actions received in each Impulse is noted in the appropriate spot on the Status Sheet.

These values can change as the Character advances in Skill Level, or changes his Encumbrance.

Combat Actions and Damage Bonus = Cross-index Maximum Speed (Step 4) and Agility Skill Factor (Step 6) on Table 2D

Combat Actions per Impulse = Found opposite Combat Actions on Table 2E

Step 8 Knockout Value

Next, the **Knockout Value** is determined and recorded. The larger the Knockout Value, the greater the ability of the Character to ignore the pain of wounds. The Knockout Value is equal to one-half of the Will Characteristic times the Character's highest Combat Skill Level, rounded off. The highest Combat Skill Level is the greatest of the Character's Gun Combat, Hand-to-Hand, or Unarmed Combat Skill Levels.

Knockout Value = .5 x Will (Step 1) x Highest Combat Skill Level (Step 2)

Step 9 Weapon Data

Weapon Data is found on the **Weapon Data Table (1)**, and should be recorded on the Status Sheet for each weapon carried. Terms used on the **Weapon Data Table** are described below.

Weight: The weapon's weight in pounds. This does not include a sheath or sling.

Weapon Speed (WS): This measures the quickness with which Strikes and Parries can be made. The higher the WS, the faster the weapon. The WS for each weapon should be entered in the following table, to find the Action Costs for basic combat activities. These Action Costs should be noted on the Status Sheet in the spaces provided. Note that weapons with a WS of 3.1 or greater use only .5 Actions to Strike or to Recover. This means that a single Action allows the Character to both Strike and Recover; both activities must be performed using the same Action. Full explanations of Parry, Set, Strike, and Recover are contained in Section 3.1.

WEAPON ACTION COSTS				
Weapon Speed (WS)	**Parry**	**Set**	**Strike**	**Recover**
1.0 to 1.1	3	3	1	3
1.2 to 1.4	2	2	1	2
1.5 to 1.7	1	2	1	2
1.8 to 2.2	1	2	1	1
2.3 to 3.0	1	1	1	1
3.1 or greater	1	1	.5	.5

Weapon Class (WC): This is the weapon's relative accuracy. The larger the WC, the easier it is to wield accurately. A Character's **Attack Level (AL)** is the sum of his Hand-to-Hand Combat Skill Level and the weapon's WC. This should be determined and recorded on the Status Sheet.

Impact Damage (ID): This is the force delivered by the weapon in a normal stroke. There are two types of ID: Cutting and Stabbing, each of which has a separate column. The numbers given in these two columns are interpreted as follows. Numbers in parentheses represent die rolls; the number equals the number of sides on the die. Thus, (6) means a six-sided die, (8) means an eight-sided die, and so forth. The second number is added to the result of this die roll.

Example: (6) + 2 indicates that the weapon does a six-sided die plus 2 points of Impact Damage, or from 3 to 8 ID.

Note that ID is not the same as damage; a stick might hit with the same ID as a sword, but it will probably do far less damage because it will not penetrate. The actual damage is determined by the type of damage done (Cutting, Stabbing, Flanged, or Blunt), and the armor being worn, as discussed in Section 3.6.

Range: This is the weapon's Range in 2 foot hexes. A plus sign (+) following the weapon's Range indicates the weapon can Tip Hit at 1 hex range greater than indicated.

A Tip Hit is just that; a blow in which only the tip of the weapon can reach the target. Cutting blows at Tip Hit range do not add the second number to the randomly rolled Impact Damage. For Stabbing thrusts and Strikes from weapons with Impact Heads, such as Axes and Maces, there is no penalty for a Tip Hit.

Example: A Saber has a Range of 2+ hexes, and normally does (5) + 2 ID when Cutting. At a Range of 1 or 2 hexes, a Cut would do from 3 to 7 points. If used at Range 3, however, it would Tip Hit and do only (5), or 1 to 5 points.

"You can kill some of the people all of the time, and you can kill all of the people some of the time, but you can't kill all of the people all of the time...because then who'll grow the food?"

Excerpt, King's Men Political Manual

1.3

WEAPONS

A fairly wide variety of weapons are presented on the **Weapon Data Table (1)**. The terms used on the Table were discussed earlier, in Step 9 of Section 1.2, and most of the weapons shown are probably sufficiently well-known that no further description is necessary. For the sake of clarity, however, and to define those few weapons which may not be familiar, a brief description of each weapon from the Table is given below. Descriptions are for standardized versions of the weapons, and are not intended to include the wide variety of weapons which could be said to fall within each of the categories.

Occasionally, terms which will be defined later in the rules are used in discussing a weapon. These terms may be found in Chapter 3.

As a final note, some weapons have two entries listed in Table 1. These are for different ways of gripping the weapons; One-Handed weapons used in two hands, for example, or staff-weapons used in a shortened or Choked Grip. In all cases, it takes 1 Action to change from one grip to the other, if both hands are free.

Archaic Weapons

The Archaic Weapons are those which would commonly be used in medieval-style combat. For the purposes of the Weapon Data, it is assumed that the weapons are not made with modern technologies and materials, but with the technology available in the era in which they were in use.

Dagger: A large knife, roughly 12 inches long, with a narrow, tapering blade.

Wakizashi: The traditional Japanese short sword.

Short Sword: Similar to the Roman Gladius, this weapon has a wide, heavy blade and is 20 inches long.

Rapier: This is the type of weapon used by musketeers and other soldiers of the 17th Century, and is similar to the epee of modern fencing. It has a long, narrow blade, which is slightly flexible, and a handguard.

Saber: The standard cavalry saber of the Napoleonic Wars and later periods. It is roughly 38 inches long, and features a slightly curved blade.

Broadsword: This is the classical straight sword of medieval combat, and is 36 inches long.

Scimitar: This weapon was commonly used in the Middle East, and has a long, curved blade.

"They seem to have recycled their plowshares."

Trebor

"Say, that looks pretty sharp. I don't suppose we could just arm wrestle over this?"

Alferd

Cutlass: A heavy sword with a thick, slightly curved blade.

Hand and a Half Sword: Also called the Bastard Sword, it is designed to be used with either one or two hands. This is especially useful for combatants wearing a Buckler-style shield, as it allows them to switch from using the weapon in two hands to Parrying with Sword and Shield at a cost of 1 Action.

Axe: This weapon features a large, thick, bladed head at the end of a short haft. Although it has short range, it can be very effective against heavy armor. It can also feature a Beak, which is discussed in Section 5.6.

Mace: This type of weapon is very much like the Axe in weight and proportion, except it features blunted Flanges instead of an edge. It does its damage by crushing an area, rather than cutting through protection. It is especially effective against heavy armors.

Lance at Charge: This is somewhat different from the Spears described below, in that the Lance is far heavier and is held couched under one arm, leaving the other hand free to use a Shield. It is otherwise simply a large, reinforced version of the Heavy Spear. It is too heavy for use in melee.

Katana: Also called a Samurai Sword, it has a slender, slightly curved blade and is normally used Two-Handed.

No-Dachi: A far larger form of the Katana, this Two-Handed weapon is well over 4 feet long.

Two Handed Sword: This is an oversized version of the traditional Broadsword, with a thicker blade.

Great Sword: As with the Two Handed Sword, except on an even larger scale; a Great Sword is over 5 feet long.

Battleaxe: A larger, Two-Handed version of the basic Axe.

Light Spear: A long wooden haft, surmounted with a pointed metal head. A Light Spear is roughly 8 feet long.

Heavy Spear: As with the Light Spear, except that the haft is thicker (and therefore stronger) and the head is larger.

Glaive or Naginata: A long staff with a sword-like blade.

Halberd or Poleaxe: A long staff with a large, heavy head like that of an Axe.

Club: A short, thick length of wood. Not a terribly subtle weapon.

Quarterstaff: This is a narrow staff about 6 feet long, often with metal reinforcements at the ends.

Mace and Chain: Also called the Morningstar, this is a rather unusual weapon. It consists of a flanged or spiked metal ball and a wooden handle, connected by a length of chain. The chain allows the ball to be whipped around at great speed, and to cause substantial damage. Spiked and flanged balls both use the Flange Table for Damage; the points on a spiked ball will turn, rather than penetrating, and create an effect very similar to that of a Flanged weapon. For Mace and Chain balls which are round, use the Blunt Table.

Nunchaku: Two short wooden staves connected by a length of chain. This weapon was originally developed as a harvesting tool, but can be very effective against lightly armored opponents.

Stick: Like the Club, this is simply a length of wood. A Stick, however, is longer and more slender.

Rock: Two types of Rocks are shown. The first is a good, comfortable fist-sized rock, and the second is a far heavier version, suited for dropping from great heights onto unpleasant people.

Modern Weapons

The Modern Weapons section of the **Weapon Data Table (1)** includes an assortment of paramilitary and non-military weapons. The weapons are generally the sort which seem to crop up in adventure settings, and for that reason the list contains some rather unusual entries. The majority of the weapons on the Modern Weapons section of the Table should be very familiar, but will be briefly described.

Baseball Bat: A standard 35 ounce Baseball Bat.

Billyclub: A short hardwood stick, of the type traditionally used by police.

Blackjack: A small weight covered with leather and attached to a short, flexible handle.

Bottle: A heavy glass bottle, of the sort used for liquor.

Bottle, Hollywood: For some reason, being hit in the head with more than a pound of glass does not seem to hurt people very much in the movies. The data shown on this line is designed to simulate the sort of bottles being used in films... whatever they are made of.

Bowie Knife: A large heavy-bladed knife, made popular by Jim Bowie of early American folklore.

Chain: A 24 inch length of heavy chain.

Chainsaw: A popular gardening implement that has seen a great deal of use in certain movies and games. Data for two versions has been supplied; those with 18 inch and 30 inch blades.

Chair: A normal bar stool.

Chair, Hollywood: As mentioned above, things are somewhat different in the movies. A Hollywood Chair simply breaks apart on the target's head or back, without causing undo damage.

Cleaver: A heavy, thick-bladed knife of the sort used by butchers.

Crowbar: A metal bar 26 inches long.

Entrenching Tool: Standard military issue digging tool, with a folding shovel blade.

Hammer: Normal household hammer, with either a 14 ounce or 2 pound head.

Hatchet: A small Axe, used for light woodchopping tasks.

Ice Pick: Essentially a narrow metal spike. Because of the extremely small point on this weapon, special rules are necessary to determine the damage it does. On all Strikes, it has a Damage Modifier (Section 3.5) of 4 times normal Impact, but it does 1/10 the Physical Damage for that Impact. This is because the point penetrates armor fairly easily, but creates only a small wound.

K-Bar Knife: A double-edged knife, typical of those found in the modern military.

Machete: Another heavy-bladed knife, commonly used to clear brush and foliage.

Pipe: A 2 foot length of heavy metal pipe.

Pipe Wrench: A 12 inch metal wrench.

Pocket Knife: Any of a variety of small knives with 2 to 3 inch folding blades.

Scissors: A large pair of normal Scissors. Damage for this weapon is modified, as with the Ice Pick; it does normal Impact, but only 1/4 normal Physical Damage (PD).

Screwdriver: A common Screwdriver, roughly 8 inches long. Similar to the Ice Pick, this weapon does normal Impact but only 1/10 normal Physical Damage when Stabbing, because of the small diameter of the wound.

Sledge Hammer: A heavy, blunt Hammer with a 6 pound head.

Survival Knife: This weapon features a 10 inch blade, and often includes a hollow handle for storing a compass, fishing line, and other "survival" gear.

Switchblade: An easily opened, locking blade roughly 3 inches long.

Two by Four: A 42 inch 2 x 4 piece of lumber.

Whip: A ten foot bullwhip, of woven leather.

Wood Axe: A long-handled Axe of the type used for chopping wood.

At the bottom of **Table 1** are entries which cover standard modern hand-to-hand weapons; Pistols, Light and Heavy Rifles with Bayonets, and Sub-machine Guns.

Players wishing to use a weapon which is not included on the Weapon Data Table should approximate its values using the data given as examples.

"Now that I know
You can't be trusted,
I don't feel bad
'Bout your head that
I busted."

Fred the Singing Bandit

1.4

ARMOR

Armor is classified by its protective capability, or **Armor Class**. This value appears on all the Damage Tables, and helps to determine the Physical Damage caused by a Strike. This Section contains the definitions of the Armor Classes, and descriptions of the various armors.

"Hey, kid, you're too young to use a Chainsaw. How about a nice Blender or something?"

Sergeant Servo

"Foot and Fist, Tooth and Nail, Send him home In a Pail."

Fred the Chainsaw Bandit

Armor Classes

There are six **Armor Classes**, as defined below. The names of Archaic armor types are used for the classes, for ease of reference. Players who wish to simulate armors for which data is not given should use these classes as guidelines.

NO: No armor. The person is effectively unarmored.

LT: Leather. This represents the degree of protection afforded by unhardened Leather.

ML: Mail. Normal Ring Mail armor, and similar armors.

BR: Brigandine. This category includes this classical armor, which is a mix of Leather and metal plates, and modern flexible armors.

PL: Plate. This is full-coverage classical Plate and similar armors.

I: Impenetrable. This class covers modern armors which are impossible to penetrate using normal hand weapons. The effects of Impenetrable armor in combat are discussed in Section 3.10.

Armor Types

The Classes of particular types of Armor can be found on the **Armor Data Table (3A)**, and rules for their use are covered in Section 3.7. A description of each of the Armor Types follows.

Clothing: Common clothing, ranging from light Leathers to normal modern clothing and similar items. Armor Class = NO. (PCCS PF equals 0)

Leather, Untreated: Thick, cured, but unhardened Leather, and very heavy clothing. Armor Class = LT. (PCCS PF of roughly .5)

Leather, Hardened: Thick Leather which has been hardened by lacquering or a similar process. Armor Class = ML. (PCCS PF equals 1)

Mail, Light: A light form of Ring Mail armor worn over light padding. Each ring is looped through four others and riveted closed. Armor Class = LT. (PCCS PF equals .5)

Mail, Regular: Mail or Chain armor made of riveted metal rings. Each ring is looped through four others. This armor is worn over a padded gambeson, which is treated as Leather armor if worn alone. Armor Class = ML. (PCCS PF equals 1)

Mail, Double: Two layers of Mail armor, worn over a heavy gambeson. Armor Class = BR. (PCCS PF equals 2)

Brigandine: Metal plates riveted to a leather garment. Armor Class = BR. (PCCS PF equals 2)

Scale: A heavier form of Brigandine, with overlapping plates riveted to a thicker garment. Armor Class = PL. (PCCS PF equals 2.5)

Plate: Large pieces of metal plate attached to each other by straps, rivets, or screws, providing complete coverage and flexibility at all joints. This is a relatively light form of Plate intended for foot combat, not jousting Plate. Armor Class = PL. (PCCS PF equals 3)

Flexible: Comes in Light, Medium, and Heavy. These modern armors are made of flexible bullet resistant material, and can be worn under clothing. Armor Class = LT, ML, or BR.

Flak Vest: Early modern-day body armor composed of a nylon jacket with fiberglass or metal armor plates inserted into its pockets. Armor Class = I.

Police Helmet: A standard lightweight helmet designed for use by law enforcement personnel, for protection against blunt impact. Armor Class = LT.

Rigid: The standard helmet and body armor being introduced into the modern military, consisting of armor plate and bullet resistant cloth. Armor Class = I.

Combat Suit: A Combat Suit is a high-tech vacuum isolation suit made of Flexible armor. A Combat Suit can be equipped with one of five different Levels of reinforced, rigid armor plate. The first value given in the Armor Class column is for the Arms and Legs, and the second is for the Head and Body. Armor Class = LT Arms and Legs, and LT, BR, or I for Head and Body.

DRGN Suit: This is a Combat Suit of special purpose which appears in the **Living Steel Adventure Game**, and has been included here for players of that game. Armor Class = ML.

Power Armor: As with the DRGN Suit, Power Armor is the subject of other products from **Leading Edge Games**, and has been included for the convenience of the players. Armor Class = I.

1.5

SHIELDS

A Shield is the primary parrying device in classical combat. Its effectiveness is dependent on its size and how fast it can be brought into parrying position. This is represented by the **Partial Parry (PP)** value (See Section 3.2). Five different types of Shields have been included, and their Partial Parry values and weights are shown on the **Parry Data Table (3C)**.

Buckler: 12 inches in diameter, round.

Round: 24 inches in diameter, round.

Heater: 24 inches by 30 inches, with a flat top and pointed bottom.

Kite: 24 inches by 36 inches, with a flat top and pointed bottom.

Scutem: 30 inches by 48 inches, rectangular.

1.6

PREGENERATED TROOPS

This Section provides data for **Pregenerated Troops** that the players can use as combatants or opponents. Everything necessary for play is provided below, except the combatants' weapon data.

To prepare a combatant, take a blank Status Sheet and record the Skill Level, Combat Actions, Damage Bonus, Armor Class, and Knockout Value given below.

PREGENERATED TROOP DATA

Troops	Skill Level	Combat Actions	Damage Bonus	Armor Class Head	Arms	Body	Legs	KV
MODERN								
Untrained	0	3	1.0	I	NO	NO	NO	5
Militia	1	4	1.0	I	NO	NO	NO	5
Green	2	4	1.0	I	NO	NO	NO	10
Line	4	5	1.0	I	NO	NO	NO	20
Line	4	3	1.0	I	NO	I	NO	20
Crack	5	8	2.5	I	NO	NO	NO	35
Crack	5	7	1.5	I	NO	I	NO	35
Elite	7	9	3.0	I	NO	NO	NO	56
Elite	7	8	2.0	I	NO	I	NO	56
ARCHAIC								
Untrained	0	3	1.0	LT	NO	LT	NO	5
Militia	1	4	1.0	LT	NO	LT	NO	5
Green	2	4	1.0	ML	LT	LT	LT	10
Line	4	5	1.0	ML	LT	LT	LT	20
Crack	5	7	1.5	PL	ML	ML	LT	35
Elite	7	8	2.0	PL	ML	ML	ML	56

Now, select a weapon from the **Weapon Data Table (1)** and fill in the Weapon Data section of the Status Sheet just as it appears on the table. Add the Skill Level to the Weapon Class to determine the combatant's Attack Level. The combatant is now ready for play.

"What do you mean, 'The worst he could do is kill a few of us up front?'"

Gerfel

2

MOVEMENT

As with PCCS, this system uses simultaneous movement and combat. For clarity, the rules governing Combat have been gathered in Chapter 3, while Movement and game mechanics are discussed in this Chapter.

Everything takes place in a continuous stream of two-second **Phases**; for ease of play and realism, each of these is broken into four one-half second **Impulses**. Players should keep the tight time scale in mind when deciding what they want to do.

2.1

GAME SCALE AND PLAYING SURFACE

In general, a hex grid should be used as a playing surface, although a table top will suffice. If a hex grid is used, each hex represents 2 feet. A group of 7 of these hexes is equal to one of the 2 yard hexes used in PCCS, as shown in **Figure 2**. PCCS players should simply move combat from their usual 2 yard hexes to a 2 foot scale when melee occurs.

"Now remember, you guys in the front. If you feel like you're dying, try to fall on their spears as you go down."

Agrat

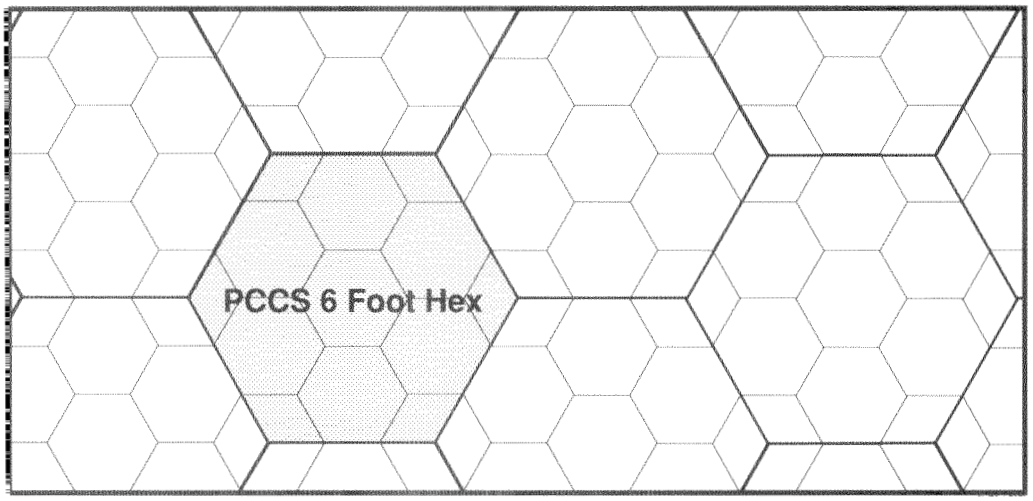

Figure 2: PCCS 6 foot Hexes and the Hand-to-Hand 2 foot hex scale

For table top players, a scale of 1/2 inch per 2 feet is most convenient. 1/3 inch per 2 feet will be necessary, however, if this supplement is to be used in conjunction with other products in the Phoenix Command line.

Regardless of the scale chosen, detailed terrain can now be included; bushes, trees, walls, windows, furniture, and so forth. To set up the game, just draw the outlines of buildings and other terrain features, such as ridge lines and gullies, on the playing surface. As much detail as is desired may be included, and it is very important to draw all features to scale.

Each Character or combatant involved should be represented on the playing field by a figure, marker, or counter. Each figure should be placed by the referee or player, as is appropriate to the scenario being played.

For the sake of simplicity and consistency, all rules will assume that the 2 foot per hex scale is in use.

2.2

COMBAT ACTIONS

Each combatant in the game has a certain number of **Combat Actions** (Section 1.2, Step 7) which determine how much he can do during a given Phase or Impulse. The Character performs one Action at a time until all his Combat Actions are used. If a task is only partially done at the end of a Phase or Impulse, it may be completed during the next one. The player should make notes of any unusual or complicated activities he is performing, so that it will be clear when they are completed. Players may also find it easier to keep a quick written record of their activities in complex combats or if they are running multiple Characters.

The **Action Time Table (3D)** gives the cost in Actions for the primary activities which occur during Hand-to-Hand combat. The Referee should determine the cost of any unlisted action using his own judgement. The Action cost would be equal to two times the time (in seconds) it would take an average man to perform the act. For example, an activity which takes an average man 3 seconds to perform would cost 2 X 3 = 6 Actions.

2.3

SEQUENCE OF PLAY

As noted earlier, the game is played in a continuous stream of Impulses and Phases, in which the combatants use their Combat Actions to move on the battlefield and fight. The Referee will mark off the passage of time, announcing each Phase and its four Impulses in a continuing cycle. Each player should note the number of Actions he has available in each Impulse, and perform or prepare his activities.

Within each Impulse, there are three steps. All players perform their actions simultaneously in each step (Movement is discussed in Section 2.5, and Combat is explained in Chapter 3).

1. **Planned Movement**
2. **Free Movement**
3. **Combat and other Actions**

After all the players have decided what they will do, they all simultaneously perform all Planned Movement. Once Planned Movement is completed, players may use Free Movement. Lastly, all Strikes, Parries, and other Actions are announced and performed. Since each Impulse is only one-half of a second long, all Actions are truly simultaneous; even if a combatant is disabled by an opponent during an Impulse, any Strikes or other Actions which he is attempting to perform will occur.

Players performing Free Movement may react to Planned Movement, and Strikes and Parries are naturally dependent on what happened during the preceding movement steps. In situations where players are reacting to each other within a step, it is sometimes necessary to establish **Initiative** guidelines. A combatant's Initiative is equal to his Combat Skill Level plus his Agility. Combatants with higher Initiative may elect to go either before or after those with lower Initiative.

2.4

FACING

The figure used to represent each combatant must always be oriented toward a hex side, showing which direction he is **Facing**. This naturally affects what areas he can see, and therefore which opponents he can Strike at and Parry. This is discussed in full below, under **Field of Attack**.

Facing Changes can be made in two ways; by standing stationary and pivoting in place, or by turning while moving. When stationary, a combatant can change his Facing by one or two hexsides for the cost of 1 Combat Action. For Facing Changes made while performing Free Movement, the cost is 1 Combat Action per hexside. During Planned Movement, a combatant may change Facing 1 hexside for every 3 hexes moved. This Facing change is free.

Field of Attack

As a combatant advances to higher levels, he is able to follow the action going on around him more closely, through careful maneuvering and by understanding the chaos of battle which his eyes report to him. The area which a given warrior can 'watch' during combat is called his **Field of Attack**.

Figure 3 shows the Field of Attack, which has been divided into six zones. Depending on the combatant's highest Combat Skill Level, as shown on the table below, his Field of Attack can cover from one to all six of these zones. Any opponent within the combatant's Field of Attack can be struck at and parried. Opponents outside the Field of Attack are not seen, and therefore cannot be attacked or parried.

"How come, just because I have a Shield, I always have to be in front?"

Alferd

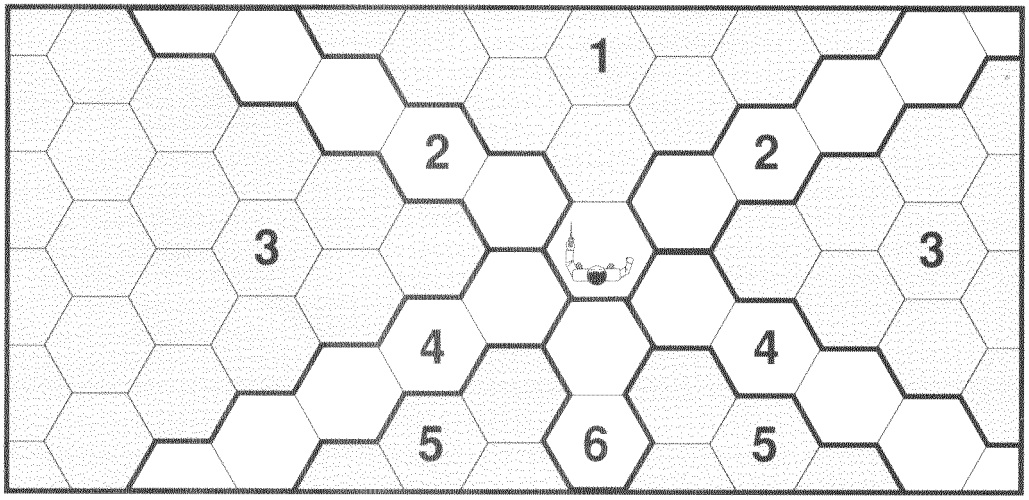

Figure 3: Field of Attack

Skill Level	Field of Attack Zones
0 - 1	1
2	1 - 2
3 - 6	1 - 3
7 - 10	1 - 4
11 - 14	1 - 5
15 - 20	1 - 6

2.5

MOVEMENT

Movement is a critical part of any melee. Combatants are constantly adjusting their positions, seeking to outmaneuver opponents, or crossing the battlefield to find new foes. The rules which govern the motion of each Character are obviously vital.

All **Movement** is associated with certain Action costs, as are Facing changes. Moving forward one hex costs one Action, moving obliquely (to any of the four side hexes) costs 2 Actions and does not change the combatant's Facing, and moving backwards costs 3 Actions.

When a combatant does not have enough Combat Actions to make a certain move within an Impulse, there are two ways of handling the problem. The ideal way is to have the player keep track of the Actions spent on the move, and to have the movement done when enough Actions have been spent. For ease of play, however, it is possible to have a player simply roll a die to see if the movement is completed, with a chance of success equal to the number of Actions spent that Impulse divided by the number required. For example, a combatant with one Combat Action who wished to move one hex backwards would have a one-third chance of success in each Impulse, until he succeeded or changed his mind about what he wanted to do.

Free Movement

The first type of movement is the incidental movement performed by each combatant in the course of battle, called **Free Movement**. In each Impulse, a combatant can move one hex for each Combat Action he has available. He can also use these Actions to change Facing. Note that these Actions do not count against his normal Combat Actions, which may be applied to Striking and Parrying.

Planned Movement

Where Free Movement covers motion performed subconsciously and at low speed, Planned Movement is for higher speed activity. Planned Movement always uses an entire Impulse; a combatant using Planned Movement does not receive any Free Movement, and may not Strike or Parry. Instead, he can accelerate to higher speeds and move rapidly across the field.

The first Impulse spent on Planned Movement allows the combatant to move a number of hexes equal to the Combat Actions he has available that Impulse. With the second, he moves his Combat Actions available that Impulse plus one hex, and on the third he moves his Combat Actions plus two hexes. On the fourth and all further Impulses of consecutive **Acceleration** during Planned Movement, the combatant may move a number of hexes up to 3 times his Combat Actions per Impulse.

There are two restrictions on the number of hexes a combatant can move during an Impulse. He can never move more hexes in one Impulse than his Maximum Speed (MS), and he cannot move more than his Combat Actions that Impulse times 3. Thus, a combatant with a MS of 4 can never move more than 4 hexes during a single Impulse, and if he has 1 Combat Action during a particular Impulse, then he is restricted to 3 hexes.

Deceleration is like Acceleration, except that stopping is easier. To leave Planned Movement, the combatant must move for one Impulse at his Combat Actions plus one hex, and another one at his Combat Actions; after that, he can leave Planned Movement.

Players can elect to cruise and hold their speed at any of the above rates. If they choose to do so, however, they still must pass through the rest of the Acceleration cycle if they decide to speed up, or the Deceleration cycle if they slow down, and they cannot do anything except Planned Movement until they have reduced their speed down to their Combat Actions per Impulse value.

Facing Changes are also somewhat different during Planned Movement. A combatant receives one free hexside Facing change, if desired, at the end of each three hexes of movement. No other Facing changes are possible, and this Facing change does not cost any Combat Actions.

Since Planned Movement uses all of a combatant's Combat Actions, he cannot perform any Parries, Strikes, or other activity. If an opponent within the combatant's Field of Attack takes a Strike, the combatant receives a **Parry** equal to his Partial Parry value minus 2 (See Section 3.2).

Example: Donovan has 5 CA per Phase, and an MS of 5. On Impulse 1, he has 2 CA and elects to use Planned Movement. He moves 2 hexes straight ahead (his CA that Impulse). On Impulse 2, he has 1 CA and moves 2 hexes (CA + 1) and turns one hexside. Impulse 3, he has 1 CA and moves 3 hexes (CA + 2). He can move 3 hexes per Impulse, and can move up to 5 (his MS) during Impulse 1 of each Phase. When he elects to stop, he must move 2 hexes during an Impulse, and a single hex during the next. He would then be out of Planned Movement, and free to do as he wished.

Passing Shots

If a target is within Range at any time during an Impulse, but out of Range at the end of the move, a combatant can take one Strike at the target if desired, using normal odds and with the normal cost in Combat Actions. This Strike is rolled for at the end of the Impulse, but if it hits any results take effect at the place of the Strike. This of course includes any disabling effects or Incapacitation which may result.

"We'll start by trying to get some allies. If that doesn't work, we'll sabotage everything in sight. And if they still don't give us what we want, then we're back to booting head."

The King's Men

3

COMBAT

Melee combat is a tightly interwoven sequence of activities. A combatant must focus his attention carefully and keep close track of his opponent's actions. A skillful warrior is very hard to hit when he concentrates on his defense, but if he must block several blows or if he is in the middle of an attack, then he becomes vulnerable. The mechanics of attack and defense are covered in this Chapter.

3.1

COMBAT ACTIVITIES

There are certain standard activities which every combatant must execute during battle, in the course of attacking and defending. For game purposes, most combat activity can be broken into four general categories. These categories are mentioned in Step 9 of Section 1.2, and are described as follows.

Parrying: Blocking an incoming blow, with either weapon or Shield.

Setting: Preparing to throw a blow, by drawing back the arm or arms, adjusting balance, and watching for weak spots in the opponent's defenses. If a Character Sets longer and more carefully, then the blow which follows will be more powerful.

Striking: The actual act of throwing a blow, including the follow-through.

Recovering: Drawing the arm back after a Strike, and getting back on balance.

The Combat Actions determine the number of these activities that can be performed in each impulse by a Character. The cost of each activity is determined by the Weapon Speed (WS); for ease of reference, the **Action Count Table** is repeated here.

WEAPON ACTION COSTS

Weapon Speed (WS)	Parry	Set	Strike	Recover
1.0 to 1.1	3	3	1	3
1.2 to 1.4	2	2	1	2
1.5 to 1.7	1	2	1	2
1.8 to 2.2	1	2	1	1
2.3 to 3.0	1	1	1	1
3.1 or greater	1	1	.5	.5

The following rules govern combat activity.

To take a blow, a Character must **Strike**. Whenever a Character Strikes, the Odds of Hitting rules are used.

After Striking, a Character must **Recover** in order to bring his weapon back into position.

Sets are used to increase the force of a Strike. Setting represents moments the Character uses to brace his feet, properly position his arm, and generally focus on the Strike which follows. A Character may decline to Set before Striking, or may Set once, or even twice, with the effects described on the following page.

If a Character Strikes without Setting, his blow is a **Short Stroke** and does 1/2 the Impact Damage listed on the **Weapon Data Table (1)**. If he Sets once before Striking, then it is a **Normal Stroke**, and does the normal amount of damage. If he Sets twice, then the blow is a **Long Stroke** and does double the normal Impact Damage. There is one special rule regarding Long Strokes; the Character cannot perform any movement at all (including Free Movement) during the second Set or while throwing the blow. This is because his feet must be planted, to provide leverage and force.

While Setting, the weapon is out of position for Parrying. If the weapon is used to Parry, any Set which has been established is lost.

A **Parry** is used to block an incoming Strike, and can also be used to perform the same service as a Recovery. If a Character wishes to receive the full defensive benefits of Parrying, he must allocate one Parry for each incoming Strike; the rules governing Parrying are detailed in Section 3.2.

The basic patterns of Striking and Setting are summarized on the following table. Note that a Parry with a weapon can always be used in place of a Recover move.

Recover - Strike = Short Stroke, 1 / 2 Impact Damage
Recover - Set - Strike = Normal Stroke
Recover - Set - Set - Strike = Long Stroke, x 2 Impact Damage

Example:

Axly is using a Light Rifle with a Bayonet, which has a Weapon Speed (WS) of 1.9. This gives him a Parry Action Cost (AC) of 1, Set AC of 2, Strike AC of 1, and Recover AC of 1. Axly has 4 Combat Actions, so he receives 1 Action per Impulse. On Impulse 1, he Parries a blow. On Impulse 2, he begins to double Set for a Long Stroke. This double Set takes 2 X 2 = 4 AC, so it is completed on Impulse 5. On Impulse 6, Axly Strikes with a Long Stroke.

Striking with the Off-Hand

There will be times when a combatant will fight with a weapon in each hand. In essence, the weapon in the Off-Hand takes the place of a Shield and is normally used as the primary Parrying device. When fighting with two weapons, either weapon may be used to Parry normally as discussed in detail in Section 3.2. The weapon in the Off-Hand, however, is limited for attack purposes unless the combatant has high Agility or has sufficient skill to make him ambidextrous. To represent this, the following restrictions apply to offensive blows (and Offensive Weapon Parries) with the Off-Hand based on the combatant's Agility Skill Factor (Step 6, Section 1.2).

Agility Skill Factor	Off-Hand Attack Limitations
less than 20	Short Stroke Stabs Only
20 - 23	Short and Normal Stroke Stabs Only
24 - 25	Stabs and Short Stroke Slashes Only
26 - 27	Stabs and Short and Normal Stroke Slashes Only
28 +	No Limitations

"It is always best to start running away early, before the rush. That way there are fewer bodies to trip over."

Gil the Treacherous

PARRYING

There are 9 **Parry Columns** on each **Odds of Hitting Table (4)** (Section 3.3). The higher the Parry Column number, the more effective the Parry. A **Full Parry** (Column 9) is by far the most effective, but is only possible under certain circumstances. When Full Parries are not possible, combatants receive **Partial Parries (PP)** of Columns 4 through 8 depending on the type of parrying device being used, or even Columns 1 through 3 for weaker or absent Parries. The general description of each Parry Column is as follows.

Parry Column	Description
1	No Parry; Attacker outside the Field of Attack
2	Base Parry; Attacker within the Field of Attack
3	Partial Parry when fighting Unarmed
4	Partial Parry with Buckler or 1-Handed Weapon
5	Partial Parry with Round Shield or 2-Handed Weapon
6	Partial Parry with Heater Shield
7	Partial Parry with Kite Shield
8	Partial Parry with Scutem Shield
9	Full Parry, with any Weapon or Shield

"You can never be too rich or too violent."

B. Toast

Whenever a combatant with a weapon chooses to Parry, he receives a Column 9 Parry against any one incoming Strike. For each additional Action used by the combatant in an Impulse for Parrying, he can use a Column 9 Parry against an additional Strike.

If there are more Strikes coming in than there are Full Parries available, the Odds of Hitting for the excess blows are determined using the Partial Parry value for the defender's primary Parrying Device. For example, a combatant with a One-Handed Weapon (Partial Parry 4) and a Kite Shield (Partial Parry 7) would receive a Column 7 Parry against all Strikes for which he did not have Full Parries.

The defender may choose which Strike or Strikes he wishes to use his Full Parries against. These decisions are made before the opponents roll to hit.

Strikes from unseen opponents (from outside the Field of Attack) always use **Parry Column 1** for the Odds of Hitting.

When a combatant is not Parrying, the Parry Column is chosen using the following guidelines. In each subsection, the rules are given for Parry Columns during each of the other primary Actions; Recover, Set, and Strike. The following rules apply in all cases.

Combat with Weapon and Shield

While a combatant is **Recovering** or **Setting**, his primary attention is on his defense. Because of this, a combatant receives one Column 9 Parry with his Shield for each Action used to Recover or Set during a given Impulse.

If the number of blows hitting in an Impulse is greater then the number of Parries available, the combatant receives a Partial Parry with his Shield against each additional blow. These blows must be from within the combatant's Field of Attack. Blows hitting from outside his Field of Attack cannot be Parried, and Strike against a Column 1 Parry.

Example: A combatant uses 2 Actions during a single Impulse to Set, so he is able to use Column 9 Parries against any 2 incoming blows. In the case of a Set, the combatant's weapon is out of position for any defensive work. It is not possible to perform any type of Parry with the weapon hand while Setting, so the Shield must be used for all Parries.

While a combatant is **Striking**, his mind is not focussed on his defenses. He receives only a Partial Parry with his Shield while Striking unless extra CA are available that Impulse for Parrying.

Example: A combatant with a weapon and a Round Shield receives 1 Action during an Impulse and elects to Strike; if someone Strikes at him during the Impulse, he receives a Column 5 Parry. If he had a Heater Shield, then his Parry would be Column 6.

Combat with Two Weapons

While a combatant is **Recovering** or **Setting**, his primary attention is on his defense. Because of this, a combatant receives one Column 9 Parry with his Off-Hand weapon for each Action used to Recover or Set during a given Impulse.

If the number of blows hitting in an Impulse is greater then the number of Parries available, the combatant receives a Partial Parry with his Off-Hand weapon against each additional blow. As in **Combat with Weapon and Shield**, these blows must be from within the combatant's Field of Attack, or they cannot be Parried, and Strike against a Column 1 Parry.

If for any reason the combatant decides to Set with both of his weapons, neither can be used for Parries and any blow arriving Strikes against a Column 2 Parry. Note that the act of Parrying breaks the Set, as detailed in Section 3.1.

Example: A combatant uses 2 Actions during a single Impulse to Set with his Primary Weapon, and would be able to use his Off-Hand Weapon for Column 9 Parries against any 2 incoming blows. The weapon being Set is out of position for any defensive work, so it is not possible to perform any type of Parry with that weapon hand and the Off-Hand Weapon must be used for all Parries.

While a combatant is **Striking**, his mind is not focussed on his defenses. He receives only a Partial Parry with his Off-Hand weapon while Striking.

Example: A combatant with a Broadsword and a Dagger receives 1 Action during an Impulse and elects to Strike with the Broadsword; if someone Strikes at him during the Impulse, he receives a Column 4 Parry (Partial Parry with One-Handed Weapon) with the Dagger.

If by some chance a combatant with two weapons Strikes with both of them in an Impulse and does not Parry, he receives only a **Column 2 Parry** against any attacks that Impulse.

Combat with One Weapon

These rules are used whether the weapon is One-Handed or Two-Handed.

As in normal combat, when a combatant uses his weapon for any sort of Parry while Setting, then he loses the Set. That is, if a combatant has performed a Set, and then Parries with the weapon, then he must begin to Set all over again; the weapon is once again out of position. Note that he does not have to Recover, since a Parry counts as a Recover.

A combatant with a single weapon receives a **Column 2 Parry** when he uses all his CA in an Impulse for Striking or Setting. When the combatant is using his weapon to Parry, he receives a Full Parry against one blow for each Action spent Parrying. He gets a Column 4 Partial Parry for a One-Handed Weapon, or a Column 5 Partial Parry for a Two-Handed Weapon, against any excess blows which land during an Impulse in which he takes at least one Parry. As with normal combat, a Recover action is treated as a Parry. These limitations mean that a fighter with a single weapon must have an edge in Combat Actions, Skill, or Range unless he is facing another single-weaponed fighter.

What follows is a protracted combat example, demonstrating the mechanics of Parrying and Striking with various weapon combinations. Some unfamiliar terms used in the example are fully described later in this Chapter, but the example only requires their common sense meanings.

Examples:

Gregor has entered a castle held by the enemy and is fighting with a Broadsword and a Heater Shield. His opponent is using a Broadsword in two hands. Each of them receives 2 CA per Impulse. On Impulse 1, Gregor uses both of his CA to Set, while his opponent completes a Set (the second of 2 AC) and Strikes with his Broadsword. Since Gregor is using his CA to Set, he can use his Shield to Parry. He gets a Full Parry (Column 9) against the attacker's blow, which misses. On Impulse 2, Gregor Strikes (1AC) and Recovers (1AC). The opponent Recovers (1AC) and begins to Set (1AC of 2). The opponent's Recovery counts as a Full Parry with his weapon; as he brings his sword back he can parry. Gregor's blow hits the opponent's Parry. On Impulse 3, Gregor Recovers (1AC), and makes a Short Stroke Stab (1AC). The opponent finishes his Set (1AC) and Strikes (1AC). Gregor uses his Recovery as a Full Parry with his Shield and the opponent misses. The opponent has a problem; while Setting and Striking his weapon cannot be used to Parry, and this leaves him with only a Column 2 Parry against Gregor's Short Stroke Stab. Gregor hits and disables his opponent.

He then spots three guards moving down from the wall of the castle. He has time to take off his Shield and pick up a second Broadsword. As the guards approach, he Sets twice with his Primary Weapon. On the first Impulse of this 3-on-1 combat, each of the guards (who receive 1 Action per Impulse) strikes. Gregor uses both his CA for Parries with his Off-Hand Weapon. His Primary Weapon remains Set for a Long Stroke. He has Full Parries for two of the guards' blows and a Partial Parry against the third with his Off-Hand weapon, here a Column 4 Parry. Gregor decides to take his Full Parries on blows from an Axe and a Mace, and the Partial Parry against a Broadsword Slash. He successfully parries the Axe and Mace blows, but the Sword hits. Luckily it strikes Gregor's Plate Helmet and does no damage. On Impulse 2, as the guards Recover, Gregor takes a Long Stroke Slash with his Primary Weapon (1AC) and a Short Stroke Stab (1AC) with his Off-Hand. He takes both blows at the guard with the Axe, who uses his Recovery AC as a Full Parry with his Shield. The guard takes his Full Parry against the Long Slash and receives a Partial Parry with his Shield against the Short Stab. Both of Gregor's blows hit, putting the guard down. On Impulse 3, the two remaining guards begin to Set for Normal blows. Gregor Recovers each weapon (1AC each). On Impulse 4, the guard with the Mace finishes his Set. The guard with the Broadsword decides to interrupt his Set and takes a Short Stab (1AC). Gregor takes a Short Stab (1AC) at the guard with the Broadsword, and Recovers (1AC). Gregor has a Full Parry with his Off-Hand against the guard's stab as a result of his Recovery AC and the guard misses. The guard is using his only Action to Strike, and as a result has only a Partial Parry against Gregor's blow; the blow hits and disables the guard. The last guard realizes that he is doomed and flees. Gregor moves deeper into the castle.

At the end of a corridor, Gregor is confronted by the Captain of the Guard and one of his aides. The Captain, who gets 5 Combat Actions, is in heavy armor and is using a Two-Handed Battleaxe, while the guard has a Broadsword and a Heater Shield. Feeling that a One-Handed Weapon will not penetrate the Captain's armor, Gregor drops one of his Broadswords and takes the other in a Two-Handed grip. Another advantage of Gregor's strategy is that it will help him to parry the powerful strokes of the Battleaxe if he has two hands on his weapon (Dropped Weapons, Section 5.13). Gregor approaches his opponents, knowing that more guards could arrive at any moment. As he steps into range, he has a choice; he could Strike (1 AC) and use his Recovery (1 AC) for a Full Parry that Impulse, or he could Parry twice. If he Parries twice he will lose the Set advantage of his opening blow. For their parts, both of his opponents have Long Strokes ready to go, since they are not moving. Gregor decides to Parry twice.

"Now let me get this straight. You parried one blow with your shield, one with your sword, and the other with your head?"

Dr. Buen-Scheuk to a patient

The Captain gets 2 Actions during the first Impulse, so he Strikes (1 AC) and Recovers (1 AC). The guard has only one Action, so he just Strikes. Gregor takes a Full Parry with his Broadsword against each blow, and neither one hits him. On Impulse 2, the Captain starts to Set (1 AC out of 2) and the guard Recovers (1 AC). Gregor Sets (2 AC). In Impulse 3, the Captain completes his Set (1 more AC) and the guard takes a Short Stab (1 AC) at Gregor. Gregor performs his second Set, which prepares him for a Long Stroke, and he counts on his armor to protect him from the guard's attack. Because his weapon is being used for a Set, he receives only a Column 2 Parry. The guard's Strike hits, but does not penetrate Gregor's breastplate. On Impulse 4, the Captain takes a Normal Slash (1 AC) while the guard Recovers (1 AC). Gregor has Set twice, so he takes a Long Stab (1 AC) at the Captain and Recovers (1 AC). This gives him a Full Parry against the Captain's blow, which is Parried. Since the Captain is Striking with a Two-Handed Weapon, he has only a Column 2 Parry; he too is counting on his armor for protection. Against Gregor's Long Stab, this proves to be an error, and the Captain goes down with a chest wound. On Impulse 5, Gregor Recovers (1 AC) and takes a Short Slash at the guard, which hits.

The Captain would have been wiser to parry Gregor's Long Stab on Impulse 4, even though it would have meant losing his Set. He has seen his opponent in action for 3 Impulses, and knows that Gregor is much quicker than he is in spite of his armor. This means that Gregor is either very skillful or very strong and agile, and that Gregor's Damage Bonus is also going to be higher than his. Given these disadvantages, the Captain should concentrate on defending himself while waiting for the guard to land a blow, or for more guards to arrive.

3.3

ODDS OF HITTING

The **Odds of Hitting Table (4)** contains twelve charts, with each representing the Odds of Hitting defenders of a different Level or Levels. Each of the twelve tables is used in the same way.

At the top of each table is the Level or range of Levels to which it applies. Down the left side of the table are the **Attack Levels**, and across the top are the nine **Parry Columns**. Players should select the proper table, depending on the Hand-to-Hand Combat Skill Level of the target, and then cross-index the Attack Level of the combatant taking the Strike with the Parry Column of the target. The number shown is the percent chance of hitting; the attacker rolls a 00 - 99 number, and if it is less than or equal to the number on the table, the Strike hits. If the roll is greater than the number shown, then the Strike is a miss.

Whenever a Strike hits, the attacker should roll the Impact Damage, as described in Section 3.6.

3.4

BLOCKING, DODGING, AND COVERING UP

When a combatant finds himself surrounded, without effective weapons, or in similarly dire straits, he may find that normal combat tactics are not effective. Blocking, Dodging, and/or Covering Up may become very attractive options.

Blocking can be used by a combatant without a weapon or a Shield. To Block, the defender must be at Range 1 from the attacker; he is assumed to be blocking the attacker's arm with his own. Blocking uses 1 Action, and gives the defender a Column 9 Parry.

If desired, a defender may attempt to Block at a Range of greater than 1. This consists of throwing an arm into the path of the oncoming weapon, and is clearly only for the extremely desperate. It gives the defender a Column 9 Parry; however, if the attacker fails to roll less than the Odds of Hitting, but does roll less than his Odds of Hitting against Parry Column 1, then the Strike has hit the forearm of the defender. Damage should be done normally, against the Forearm hit location.

"The first lesson of war, my son, is that you can only parry a sword blow with your hand once."

Louie the One-Armed Wonder

Dodging is difficult in melee, but has certain advantages. It is simply an effort to avoid attacks by moving erratically, and it affects all incoming blows. A combatant who chooses to Dodge may do nothing else except Free Movement for 4 full Impulses (a complete Phase), and receives a Parry Column equal to his Maximum Speed minus 1 against all Strikes taken at him during that time. For example, a combatant with a Maximum Speed of 5 would receive a Column 4 Parry against all Strikes, if he chose to Dodge.

A combatant carrying a Shield that is Round or larger can choose to **Cover Up**, which means he is hiding behind his Shield. Combatants without Shields or similar large parrying objects may not Cover Up. A combatant who Covers Up may do nothing else during that Impulse whatsoever, but Covering Up affects all Strikes coming from within the defender's Field of Attack, and gives a Parry Column equal to the Partial Parry plus 1. Free Movement costs are doubled when Covering Up.

3.5

DAMAGE MODIFIERS

There are a number of possible conditions that can alter the force of a Strike. The most common of these are the **Damage Bonus (DB)** of each Character and the Stroke type (Short, Normal, or Long), which were described earlier. Several other modifiers are listed below. In all cases, the appropriate Damage Bonus is multiplied by the rolled Impact Damage (ID) of a Strike to determine the actual ID. More than one can apply; simply multiply each applicable modifier into the total.

Damage Modifier	Condition
1.5	Striking Down (from horseback, or at a kneeling or prone target)
.8	Striking Up (at rider from foot, or to a higher elevation)
.6	Striking From Knees (includes Striking Up modifier)
.4	Striking While Prone (includes Striking Up modifier)
2.0	Solidly Braced Target
.5	Striking While in an Opponent's Grasp
1.5	Closing Speed of 3 Hexes per Impulse
2.0	4 to 6 Hexes per Impulse
3.0	7 to 9 Hexes per Impulse
4.0	10 to 12 Hexes per Impulse
5.0	13 to 15 Hexes per Impulse

Note that **Lances** are listed in the **Weapon Data Table (1)** as being used "At Charge"; the Closing Speed Damage Modifier has already been included in the Weapon Data.

Example:

Axly is Striking Down at a Solidly Braced Target, is taking a Long Stroke, and his personal Damage Bonus (DB) is 1.5. The ID done by the Strike would be 1.5 (Striking Down) x 2.0 (Solidly Braced) x 2.0 (Long Stroke) x 1.5 (DB) = 9.0 times the rolled damage.

"These war dogs just aren't working out. I can't even teach them to Sit, and just forget about teaching them to Parry."

Animal Trainer Axly

3.6

WEAPON TYPES / DAMAGE TABLES

A given weapon can be used in a wide variety of ways. A Broadsword, for example, can be used to either slash or thrust, and the pommel and hand guard can even be used to punch. Depending on how it is used, it can strike with widely varying degrees of force and effect. The following rules define how to choose the Impact Damage columns and the Damage Tables when determining the results of a Strike.

On the **Weapon Data Table (1)**, most weapons have two columns for Impact Damage; **Cutting (IDc)** and **Stabbing (IDs)**. The Cutting column is for normal slashing strokes, whether with an Edged, Flanged, or Blunt weapon, while the Stabbing column is for thrusts. The first number in each entry is in parentheses and represents a die roll, with the number equal to the number of sides on the die; if there is a second number (one not in parentheses), it is added to the result of the die roll. For example, a Cleaver does (4) +3 if used for Cutting; a four-sided die would be rolled, and 3 would be added to it.

Note that normal six and ten-sided dice can be used to substitute for unusual dice sizes; just ignore inappropriate values and roll again. The roll of a twelve-sided die can be simulated by rolling two six-sided dice of different sizes or colors. One of the dice is declared by the roller as the Determiner; if it comes up a 1, 2, or 3, then the roll of the second die is taken as the result. If it comes up 4, 5, or 6, then 6 is added to the value of the second die to find the result.

The player should determine the Impact Damage of his Strike using these columns.

The **Damage Tables (5)** are in four sections; Cutting, Stabbing, Flanged, and Blunt. The table selected for a given Strike depends on the type of weapon being used. Slashing blows with Edged weapons, such as Broadswords and Axes, use the **Cutting Table**. The **Stabbing Table** is for thrusting blows with pointed weapons, such as Spears, Broadswords, and Bayonets, while the **Flange Table** covers Strikes with Maces, gun barrels, and other weapons with hard, narrow striking surfaces. The **Blunt Table** is used for attacks with wooden weapons and those that have large striking surfaces with no edge, such as Sticks, Clubs, gun stocks, and so forth.

3.7

HIT LOCATION AND DAMAGE

"It is usually better to be stuck through than cut through. On the other hand, being mashed flat isn't so bad."

Death Bunny

Once the Impact Damage has been determined and the correct **Damage Table (5)** selected, the following rules are used to find the **Hit Location** and **Physical Damage (PD)** inflicted on the target.

Down the left side of each of the Damage Tables is a column of Hit Locations which divide the body into its significant areas. There is some variety among the tables, depending on what areas are most likely to be hit by the different types of weapons. The attacker rolls a 00 - 99 number, and finds which Hit Location should be used.

At the top of each table is the **Armor Class** and **Impact Damage** section. Just choose the Armor Class line which represents the target's Armor on the proper Hit Location, and read across that line until you find the Impact Damage done by the blow. If the amount of the Impact Damage falls between two columns, use the column with the lower number. For example, using the Cutting Table on the Plate (PL) line, a hit for 36 ID would use the 33 ID column. On the Flange and Blunt Tables, the Armor Class lines are replaced with Blunt Protection Factor (BPF) lines; choose the line for the BPF of the Armor on the proper Hit Location.

Once the correct column has been chosen, follow it down into the body of the table and cross-index it with the Hit Location. The number given is the amount of Physical Damage that the target has taken, and this should be recorded on the target's Status Sheet. In some places, letters are used in the tables. An "H" indicates Hundreds of PD, "K" means Thousands, "T" means Tens of Thousands, and "X" means Hundreds of Thousands. Thus, 1H means 100 PD, and 6K means 6,000 PD. A running total of PD must be kept; the significance of PD is covered in Section 3.8.

Example:

Donovan is in Leather armor (Armor Class = LT) and is hit by a Slash from a Broadsword. The Strike does (6) + 2 points; his opponent rolls a 5 and has a DB of 1.0, so the blow does 7 ID. The Cutting Damage Table is used, and the Hit Location is a 62, the Left Upper Arm. Cross-indexing the Upper Arm and 7 ID on the LT line gives an 11 PD injury.

In several places, PD values stop; that is, they reach a certain value and the rest of the line is blank. Strikes with a greater number of ID than necessary to reach the last value on that Hit Location should take the last number for the PD of the hit. On the Cutting Table, this indicates that the limb in question has been severed. For Stabbing blows, it means that the head of the weapon has passed entirely through the target and emerged from the other side. On the Flange and Blunt Tables, it means that the area of the impact has been fully crushed, or that the Flange has penetrated as far as it can.

A good example of this is the Upper Arm Hit Location on the Cutting Table. On an Unarmored target (the NO line), a Strike with 18 ID does 2K, or 2,000 PD. At 19 or greater ID, the line is blank. this indicates that the Strike does 2,000 PD and the Arm has been severed.

3.8

DISABLING INJURIES AND KNOCKOUT

It is obvious that few people continue fighting until they are actually dead, and that it is very possible for limbs to be fractured or broken during combat. This Section supplies the rules to govern Disabling Injuries, and to determine when a combatant loses consciousness or is otherwise unable to continue fighting.

If the damage from a Strike is in a shaded area of the Damage Table, then the limb in question has been Disabled. It cannot be used for the remainder of the battle. Shock Effects due to pain of broken bones can be included using the Shock Rules of PCCS Section 3.3.

If the **Neck or Torso is Disabled**, this indicates a spinal injury. The combatant is paralyzed and considered Incapacitated.

If an **Arm is Disabled**, then the combatant drops his Weapon or Buckler; only Shields with straps remain attached to the arm. The combatant may not perform any Strike, Parry, or any other action with the Disabled Arm, and his Partial Parry (if he has a Shield strapped on) is -2 Columns. For example, a Heater would only have a Column 4 Partial Parry.

If a **Leg is Disabled**, then the combatant must go to his knees. Combatants on their knees have their Free Movement sharply limited; they may only change Facing by one hexside per Impulse, but may not perform any other Free Movement at all. In addition, all Planned Movement is executed at 4 times the normal cost.

Consciousness is the next issue. This is represented by the **Knockout Roll**, which compares the Total PD taken by a Character with his Knockout Value (Step 8, Section 1.2). Each time a Character is wounded, the player enters the **Knockout Table** (below, and on the Status Sheet) with the new PD total to find the Knockout Chance. A 00 - 99 Knockout Roll is made, and if less than the Knockout Chance is rolled, the Character is unconscious or otherwise unable to continue. If the player rolls greater than or equal to the Knockout Chance, then he remains conscious and is limited only by Disabling Injuries.

"Oh, great, Dirk. One little stab in the Intestines and you're down."

Terras

Knockout Table

Total PD	Knockout Chance
Under 1/10 KV	00
Over 1/10 KV	10
Over KV	25
Over 2 x KV	75
Over 3 x KV	98

Example:

A Character has a Knockout Value (KV) of 15, and has taken 14 PD from previous wounds. He is now hit by a cut to the Abdomen, and takes 2 more PD. His PD Total is now 16. Since the PD Total is over his KV, but less than two times his KV (which would be 30), he must roll a 25 or higher to remain conscious.

A Character must make a Knockout Roll once each Impulse in which he is injured. No more than one check should be made per Impulse, regardless of how many blows strike. The check should naturally be made after totalling all the PD received that Impulse.

If a Character is Incapacitated, it is still possible for him to return to the battle before it is over. Cross-index the PD Total with a 0 to 9 random roll on the **Incapacitation Time Table (6B)**, to get the time required to return to action. See Section 4.2 for the Character's combat capabilities following recovery.

3.9

UNARMED HAND-TO-HAND COMBAT

Although most battles are fought by armed combatants, players may occasionally need to simulate unarmed combat as well. For these situations, data on some basic unarmed combat maneuvers have been included.

The entries and information on the **Unarmed Hand-to-Hand Combat Table (3B)** should be used when it is necessary to simulate an unarmed combat. Action costs and combat rules are the same as for normal armed combat, with damage resolved on the **Blunt Damage Table (5D)**.

Note that this is not intended to represent the use of advanced Martial Arts, but is a general system for combatants without sophisticated training.

3.10

IMPENETRABLE ARMOR

The Armor Class given for certain modern and high-tech armors is **Impenetrable**. This simply means that normal hand weapons cannot generate enough force to pierce them. Combatants who are wearing Impenetrable armor do not take normal Cutting, Stabbing, or Flanged damage, but can suffer Blunt damage as follows.

When a Strike hits Impenetrable armor, divide the Impact Damage (ID) of the Strike by the **Blunt Protection Factor (BPF)** of the armor, and enter the appropriate line on the **Blunt Damage Table (5D)** with the remaining ID. The Blunt Protection Factor for each type of armor is given on the **Armor Data Table (3A)**.

Example:

A combatant wearing a Flak Vest is hit in the Abdomen with a Strike doing 33 ID. The BPF for a Flak Vest is 3, so the effective ID of the blow is 33 divided by 3, or 11 ID. Going to the BPF 3 line of the Blunt Damage Table with 11 ID, the damage for the Abdomen Hit Location is 5 PD.

4

MEDICAL AID AND RECOVERY

After a battle, all combatants who are wounded must see if they will survive their injuries. There is no set amount of Physical Damage which automatically kills a person; even the seriously wounded can survive, especially if Medical Aid is available. This Chapter determines the chances of survival and the effects of Medical Aid.

4.1

BASIS FOR RECOVERY

During combat, a running total is kept of the Physical Damage (PD) taken by each combatant. This **PD Total** helps to determine the **Damage Total (DT)**, which measures the severity of injuries. The greater the Damage Total, the more severe the injuries and the higher the chance of dying. For most troops, the DT is the same as the PD Total. For special troops, such as Characters in role-playing games, the DT is determined by the following formula.

Damage Total = PD Total x 10 / Health Characteristic

Example:
Gil has received two wounds, of 14 and 2 PD, giving a PD Total of 16. His Health is 9, and so the Damage Total = 16 x 10 / 9 = 160 / 9 = 17.8. This rounds to 18.

The DT is entered on the **Medical Aid and Recovery Table (6A)** to determine the Critical Time Period (CTP), Recovery Roll (RR), and Healing Time (HT).

The **Critical Time Period** is the time during which a combatant must receive Medical Aid if it is to be effective. At the end of the CTP, he must make the **Recovery Roll**. If he makes the RR, he will survive. If he fails, he dies.

"Hey, Gerfel, wake up. Can you hear me? You're dying."

Trebor

The RR and the length of the CTP are given in several columns opposite the Damage Total on the **Medical Aid and Recovery Table (6A)**. The column selected depends on the type of Medical Aid available; naturally, Medical Aid greatly improves the chance that the victim will survive. The levels of aid are separated into five categories; No Aid, First Aid, Aid Station, Field Hospital, and Trauma Center. Each category has its own CTP's and RR's. Note that there are six RR columns under the Trauma Center category; each of these represents a Hospital of increasing Technology Level. The time period represented by each Technology Level is given on **Table 6C**.

The **Healing Time (HT)** is the time required in days for injuries to completely heal. Enter the DT on **Table 6A** to find the HT. This is reduced by 20% if the injured combatant receives his treatment at a Trauma Center, due to the superior quality of attention available. The Healing Time begins when the injury occurs.

Example:
Donovan has a DT of 3000. Referring to Table 6A, under the column labelled No Aid we see his CTP is 81 Phases. He has 81 Phases to receive Medical Aid before he must make his RR (which, by the way, is not good.) Luckily, a medic arrives before the end of the CTP and treats him. Referring to the column labelled First Aid at a DT of 3000, we see that the medic has increased his CTP to 2 hours. His RR is still 00, however. He is therefore rushed to a Tech Level 13 Trauma Center before the end of 2 hours. His new CTP is now 18 days, and his RR is 30. 18 days after the injury, he rolls (00 - 99) to see if he recovers. If less than or equal to a 30 is rolled, he survives; if greater than a 30 is rolled, he dies. If he survives, the Healing Time is 88 days, minus 20% for his Trauma Center stay; it will take him 70 days from the date of his injury to completely heal.

Note that Disabling Injuries remain in effect until completely healed.

WOUNDED CAPABILITIES AND HEALING

Whenever a combatant is suffering the effects of an unhealed injury, his physical capabilities can be reduced. This reduction depends on the status of the combatant's wounds. The three categories of unhealed wounds are Recent Wounds - Combatant Makes Knockout Roll, Recent Wounds - Combatant Fails Knockout Roll, and Old Healing Injuries.

Recent Wounds - Combatant Makes Knockout Roll

Recent wounds are wounds suffered during the current combat. One hour after the injury, they are considered Old Healing Injuries. As long as the combatant makes his Knockout Roll, he is affected only by Disabling Injuries (Section 3.8) and can continue combat subject only to those limitations. These fresh injuries, if not disabling, are ignored due to the effects of adrenaline and other adjustments made by the body during crisis.

Recent Wounds - Combatant Fails Knockout Roll

A combatant who fails his Knockout Roll is Incapacitated. The time he remains dazed or knocked out is found on the **Incapacitation Time Table (6B)** by cross-indexing a 0 to 9 roll with the PD Total. After the Incapacitation Time, the combatant regains consciousness and suffers a penalty to his Combat Actions equal to the Healing Time for his injuries divided by 20, in addition to any Disabling Injuries.

Example: A combatant has failed his Knockout Roll and has a PD Total of 33. To determine how long he remains Incapacitated, the player rolls a ten-sided die and consults Table 6B. He rolls a 2, and so he regains consciousness in 1 Phase. After regaining consciousness, his Combat Action penalty equals 43 (the Healing Time for a DT of 33) divided by 20, or 2 Combat Actions. Each Phase, he will have two less CA than would be normal for him.

Old Healing Injuries

From one hour after the injury until the time the wounds heal, the combatant has his Combat Actions per Phase reduced. To find how many CA are lost, divide the number of days remaining until the injuries heal by 20 and round off. Subtract this number from the combatant's Combat Actions.

Example: Gil has a Damage Total of 18, and a Healing Time of 35 days. So, from one hour after his injury until the end of the first day, he has a penalty to his CA of 35 divided by 20; this equals 1.75, which rounds up to 2 CA. One week later he would have 28 days remaining until he is healed, and so his penalty would be 28 divided by 20. This is 1.4, which rounds down to a 1 CA penalty.

"Look, Dirk, if you're going to bleed, bleed on the enemy."

Horatio

5

OPTIONAL RULES

The following rules govern unusual or special situations, or were left out of the other Chapters for reasons of simplicity. Players may use any or all of these rules as they desire, and will find that they enhance the realism of the game. The set of Optional Rules which will be used should be agreed upon by all players before the start of the game.

5.1

GLANCING

Much of the protection afforded by armor is not due to its thickness or toughness, but to its tendency to deflect weapons. This is called **Glancing**, and can be represented by using the following rules.

After the ID of a Strike has been rolled, and after the inclusion of all Damage Modifiers, a 0 to 9 number should be rolled and the **Glancing Table (5E)** consulted. The top section of the table is for Cutting, Flanged, and Blunt Strikes; the bottom section is for Stabbing blows. The player should use the appropriate section, and cross-index the number rolled with the Armor of the target in that Hit Location. Note that the Armor used should reflect what the Armor is made of, rather than the Armor Class itself; for example, Light Mail (Armor Class LT) would use the Mail line on the table. For Modern and High Tech armors, treat Flexible Armor and Combat Suits as Mail, and treat Flak Vests, Rigid Armor, and Combat Suit Armor Panels as Plate.

The number on the Glancing Table is used as a Damage Modifier, as in Section 3.5.

5.2

RAMS AND COLLISIONS

Sometimes, whether through accident or design, combatants collide on the battlefield. This Section provides guidelines for those situations. When two combatants run into each other by accident, it is called a Collision; until the moment of impact, both combatants have complete freedom to do whatever they want. When one combatant deliberately runs into another one, it is called a **Ram**. The Ramming combatant may perform no Actions during the Impulse he Rams except for Movement. If he has Set to Strike, then the Set is lost. Except for that one difference, Collisions and Rams are run using exactly the same rules and the terms are interchangeable. Both of the combatants involved can suffer from the results of the Ram.

The primary factors in a Ram are the closing speed, called the Velocity, and the combatants' relative Strengths and Skill Levels, or **Collision Factor (CF)**. These combine to produce the Knock Down value, which determines the loss of Actions and the chance of each combatant being knocked down.

First, determine the closing speed of the two combatants. This is equal to the number of hexes closer together the two would draw during a full Impulse of movement. For example, if two combatants were running straight at each other, at 3 Hexes per Impulse each, then their closing speed would be 6. This number is the Velocity, and is used in the table on the next page.

To find the **Collision Factor**, add the Strength and Combat Skill Level of each of the combatants together; that is, add the Strength and Combat Skill of the Rammer together, and then those of the target. Next, find the difference between the CF's. Subtract the smaller CF from the larger; this total should be **added** into the formula that follows when calculating the Knock Down value against the combatant with the lower CF, and **subtracted** when determining the Knock Down value against the combatant with the higher CF. (Common sense will help keep this straight; the combatant with the lower CF will have a higher Knock Down value against him than his larger, more capable opponent.)

Collision Knock Down Table

Velocity	Knock Down Value
1	5 + 2 (6) + Difference between the CF's
2	10 + 2 (6) + Difference between the CF's
3	15 + 3 (6) + Difference between the CF's
4	20 + 4 (6) + Difference between the CF's

That is, with Velocity 1 the Knock Down Value equals 5, plus 2 times the roll of a six-sided die, plus the difference between the CF's. Each combatant rolls separately to determine the Knock Down value of his opponent.

The pattern in the table continues, with the addition of 5 points and one more multiple to the six-sided die roll with each additional hex of Velocity.

If one combatant is unprepared for the Ram or Collision, then his CF for that Ram is treated as 0. If they are both unprepared, then the CF is calculated normally.

Example:

Donovan (Strength 13, Level 3) is moving at 2 Hexes per Impulse and Rams a stationary opponent with Strength 9 and a Combat Skill Level of 2. Donovan's CF is 16, the target's 11. Donovan rolls a six-sided die, and gets a 3. This is entered into the formula, and so the Knock Down value against the target is 10 + (2 x 3) + (16 - 11), or 10 + 6 + 5 = 21.

The target player now rolls a six-sided die, and gets a 4. Therefore, the Knock Down value against Donovan equals 10 + (2 x 4) + (11 - 16), or 10 + 8 - 5 = 13.

"Well, Dirk, if you're going to die, could you at least die in a strategically useful position?"

Norman Steele

Knock Down

The Knock Down value is a relative measure of the power of the Ram, and is the same as the Knock Down value in Section 5.12 of PCCS. The results of a certain amount of Knock Down to a given location are the same whether the combatant is the Rammer or the target, and are given below.

For a normal Ram, the Knock Down value is applied to the Body of the Rammer and the target on the following Knock Down Table. If the Rammer is attempting to Tackle the target, the attacker decides which hit location he would like to grab. The attacker then adds his Skill Level to the number given above the Hit Location and subtracts the target's Skill Level. The attacker must roll less than or equal to this total on the sum of 3 six-sided dice to grab the target. If he fails, his Tackle misses and the target is unaffected. Note that the attacker must have his arms and hands free and cannot Parry or Strike when Tackling. The results of being Knocked Down are discussed in Section 5.3.

KNOCK DOWN TABLE				
Tackling Base Odds	**8**	**16**	**10**	**14**
Collision Results	**Head**	**Body**	**Arm**	**Leg**
-1 AC	2	11	2	3
-2 AC	3	14	3	4
-4 AC	4	17	4	5
-4 AC and Knocked Down	10	19	16	6

Example:

In the preceding example, Donovan took 13 points of Knock Down from a Ram. This goes against the Body, so he loses 1 Combat Action.

Donovan's opponent took 21 points of Knock Down from the Ram. He loses 4 Combat Actions, and is Knocked Down.

Extreme Maneuvers

If the Rammer is using Planned Movement, then it is likely that the target will try to step out of the way using Free Movement. To compensate for this, the Rammer is allowed to attempt an Extreme Maneuver. This is a last-instant adjustment of course beyond what is normally allowed during Planned Movement.

To perform an Extreme Maneuver, the combatant must roll less than or equal to his Agility on 3 six-sided dice; if he succeeds, then he may move one hex in any direction. If he fails, then he stumbles and falls down, using the normal rules of Section 5.3.

Extreme Maneuvers may be used in other situations as well. If a combatant misjudges distance, has someone step into his path, or suddenly discovers some danger ahead of him, for example, he may make a sudden course correction using the Extreme Maneuver rule.

Multiple Collisions

If more than two combatants end up in a hex during a single Impulse, then the Collision is run as follows. The defender (if there is one) may use his CF against only one attacker, but he may choose which one. Against the other, he is assumed to have a CF of 0.

If there is no defender, and instead three or more combatants all blunder into the same hex by accident, then none of them apply their CF, and each one hits one of the other parties, rolled randomly.

5.3

KNOCKBACK

It is possible for a powerful blow to knock the target off balance, or even off his feet. Other possible causes for this are discussed in the Rams and Collisions rules (Section 5.2). This Section discusses how Knockbacks occur in combat, and what the results of being knocked off-balance are.

Knockback During Combat

If the ID of any one blow is greater than 10 plus the Combat Skill Level of the target, then the target loses 1 Action during the next Impulse or Impulses. If the ID is greater than 20 plus the Combat Skill Level, the target loses 2 Actions, and at 30 plus the Combat Skill Level he loses 4 Actions. If the ID is greater than 40 plus the Combat Skill Level of the target, then the target loses 4 Actions and may be **Knocked Down**. The combatant must roll less than or equal to his Agility on 3 six-sided dice, plus 1 for each 10 points of ID over 40, plus his Velocity.

This rule applies to any blow which hits the target or the target's Parrying device.

Knockdown

Any time a combatant is Knocked Down, including as the result of a Ram or Collision, the following guidelines apply. Any Action penalties are in addition to these rules. First, it generally takes the combatant 1 Impulse to fall to the ground. If he is moving quickly, then he may cover considerable ground while doing this; see the next subsection for a description of this. During the time it takes to fall, the combatant may perform no Actions. Any Action penalties take place after the combatant has hit the ground, but before he attempts to do anything else.

Once he has fallen, it takes 3 Actions to roll into a position from which he can Parry or Strike, and an additional 3 Actions to rise to his feet or 2 Actions to position himself on his knees. While on the ground, the combatant receives no Free Movement Actions; the cost of rolling into position or rising comes directly out of the combatant's regular Combat Actions. The only Planned Movement possible for a combatant who has been Knocked Down is Rolling. This costs 2 Actions per hex, and may only be performed to the sides of the combatant's Facing.

Knockdown Position

"I've never shot a man who wasn't at the end of my bayonet."

Bayonet Pete, a man largely unclear on small arms tactics

How a combatant falls, or where he ends up after being Rammed into, is the next consideration.

Stationary combatants who are Knocked Down or who lose Actions due to a Ram or Collision can be moved one or more hexes as a result of the impact, as shown in the following formula.

Number of Hexes Moved = (Impact / 20) - 2 Hexes

Round this total off to the nearest Hex. Obviously, if the result of this is less than or equal to 0, then the combatant does not move. Any movement is executed directly away from the Impact.

If the combatants involved are moving, however, then the following guidelines apply. The players should first determine the **Remaining Velocity** in 2 foot hexes per Impulse, which is the speed left over after the Ram. This is the momentum that has not been absorbed by the Collision, and may be determined using common sense. For example, if two combatants are running side by side in the same direction and bump into each other, then they would still be moving at most of their Velocity. If two combatants ran head-on into each other, on the other hand, then most of their Velocity would be absorbed by the Collision.

Enter the Remaining Velocity on the following table to determine how many hexes the combatants move, and how fast, before they finish falling. After a Fall is caused, combatants move in the direction of their Remaining Velocity.

TWO FOOT HEXES MOVED AFTER A FALL			
Remaining Velocity Hexes per Impulse	2 Foot hexes Moved		
	Impulse After Fall	Next Impulse	Third Impulse
1	1	1	–
2	2	1	–
3	3	2	–
4	4	2	–
5	5	3	1
6	5	4	2
7	6	5	2
8	7	5	2

5.4

BROKEN FIELD MANEUVERING

It is often necessary for a combatant to avoid debris and fallen bodies while moving across the battlefield. This can be a serious problem for those who want to move quickly. This situation is governed by the following rules.

If a combatant wants to safely enter a hex which contains a fallen body or other low-level obstacle, he must use 2 Actions of Free Movement. If only 1 Action is used, the player must roll less than or equal to the combatant's Agility on 3 six-sided dice, or he stumbles and loses 4 Actions. If he fails the first roll, a second should be made after the 4 AC penalty has been paid; a second failure indicates that the combatant has actually fallen (See Section 5.3).

Moving through an obstructed hex at any speed during Planned Movement requires an Agility roll, as described above.

5.5

OFFENSIVE WEAPON PARRIES

An armed person has the option of taking a Strike at an opponent's weapon, in an attempt to Parry an incoming blow. This is called an **Offensive Weapon Parry (OWP)**, takes 1 Action, and may be taken as a Short Stroke (that is, no Set is required.) An Offensive Weapon Parry can be a very effective way of defending against a slower weapon, and can even disarm an attacker. Rules governing the Offensive Weapon Parry are as follows.

To take an Offensive Weapon Parry the defender must prepare a blow and time it to intercept the opponent's strike. To do this, the defender must use 1 AC that Impulse for an OWP. If the opponent does not Strike, then the combatant attempting the OWP must roll less than or equal to his Agility on 3 six-sided dice. If he does so, he may hold his OWP until the next Impulse or until the blow is thrown. If he fails, it means he has mistimed the OWP and has actually thrown the blow. This swing has no chance of hitting the opponent, and the defender must Recover before using his weapon again.

If the opponent is Striking during the Impulse that the defender decides to use an OWP, the chance the OWP will be successful is equal to 30%, plus or minus 5% for each level of difference in the Attack Levels of the two combatants.

If the OWP hits, then the Strike being taken by the target weapon automatically misses.

In addition, as mentioned above, there is a chance that either combatant will be disarmed. Roll the ID normally for each of the weapons. If the Glancing rules are being used, each rolls Glancing as a Stabbing weapon against Plate.

For each combatant, take the ID of his weapon and subtract the ID of the opponent's weapon and the Skill Level of the opponent from it. If the total is less than or equal to 0, then there is no chance of the opponent dropping his weapon. For every point that the total is greater than zero, however, there is a 1% chance that the opponent will drop his weapon.

If the OWP misses, then the opponent takes his Strike normally, using the normal Odds of Hitting. Note that a combatant who takes an OWP can also Parry normally, as if he were taking a blow.

Example:

Humbert is 3rd Level and is using a Broadsword (WC = 0), giving him an AL of 3. His opponent is 2nd Level and is attacking him with a Halberd (WC = -8), for an AL of -6. This gives a difference of +9 Attack Levels. Humbert elects to try an Offensive Weapon Parry on Impulse 1 and expends 1 AC. His opponent does not strike on Impulse 1, so Humbert must roll to see if he can hold his OWP. Humbert rolls a 10 on three six-sided dice. This is less than or equal to his Agility Characteristic and he holds his blow. On Impulse 2 Humbert again expends 1 AC for a OWP. This time the opponent Strikes. Humbert's chance of succeeding with his OWP is 30% plus 9 times 5% (45%), or 75%. Humbert rolls an 87 and misses. The opponent's blow rolls to hit normally against Humbert's Partial Parry with his Off-Hand.

5.6

BEAKED AXES

A **Beaked Axe** is a weapon specifically designed for use against heavy armor. It is essentially a 3" spike, or Beak, attached to one side of a normal Mace, Axe, or other weapon. This Beak allows a great deal of force to be focussed on a single point, thereby penetrating armor, but the weapon has reduced accuracy and an increased chance of Glancing. The Beak does the ID of a Cutting stroke with the weapon, but this ID is entered on the **Stabbing Hit Location and Damage Table (5B)**.

If a combatant is using the Beaked side of his weapon, then his **Weapon Class** (and therefore his Attack Level) is reduced by 2. Moreover, the **Beak Glances** as a Stabbing weapon, with a -2 modifier to the 0 - 9 Glancing Roll (Section 5.1). If the Glancing Roll is less than 0, the Beak has glanced off the target and caused the weapon to rotate in the user's hand. This rotation means the Beak is no longer aligned to strike the target and the user must expend 3 AC specifically to realign the weapon. If he does not realign the Beak, all further blows are treated as attacks with a Blunt Weapon unless the Beak is attached to a weapon that has striking surfaces on all sides, such as a Mace. Note that the Beak can rotate each time it hits a Shield Parry. Lastly, the penetration of the Strike is limited by the length of the Beak. The Beak may not penetrate past the third column on the Stabbing Damage Table. Any ID beyond the number necessary to reach this point are wasted; the shaft of the weapon is against the target, and no further penetration is possible.

"That's Unreasonable!"

Horatio

The same rule may be used to model nails driven through Baseball Bats, and similar instances of narrow Stabbing points attached to Cutting weapons. Note that if a combatant rolls a number that would have hit with the normal WC but misses with the -2, then he has hit with the shaft but not with the nail or Stabbing point. Blunt damage should be applied, as appropriate. Note also that a nail is a very narrow Stabbing point, and does 1/10 normal PD as with Screwdrivers.

How common Beaks are in a game or campaign should be left to referee discretion. Be forewarned, however, that while Beaks are inaccurate and unreliable, they can be quite lethal.

5.7

CHAINSAWS

As a weapon, the **Chainsaw** remains a bizarre novelty. It is not sensible, reasonable, or even terribly efficient, but it holds a certain fascination and has been included for that reason. Unlike the other weapons in this supplement, a Chainsaw does not penetrate by impact, but by sustained contact and cutting. In a fight, it is unlikely that a combatant will be able to apply the blade for extended times.

For a Chainsaw, the **Cutting Power** is critical. The Cutting Power is equal to the ID rolled, minus the following **Armor Adjustment**. Targets with NO armor have an Armor Adjustment of 0, those with LT have an Adjustment of 4, ML is 8, BR is 10, PL is 12, and I is infinite; it cannot be penetrated by a Chainsaw.

"That's Disgusting!"

Horatio

Enter either the Cutting or Stabbing Damage Table, depending on the type of Strike taken, with the Cutting Power as ID against a NO target. This gives the **Base PD**. The Base PD is then multiplied by 6, representing the large area being cut by the Chainsaw, to determine the actual PD.

If the Cutting Power is greater than or equal to 0, then on the next Impulse the attacker may choose not to Recover, but to Strike again. He must again roll to hit, and if he hits, the blade is still in contact and a new ID should be rolled. Subtract 1/2 the normal Armor Adjustment from this, and add the new Cutting Power to the old Cutting Power. This new number is now entered on the NO line as ID, for the damage caused during the second Impulse. If the attacker misses, then the Chainsaw has been dislodged and any further Strikes must begin as initial hits.

Example:

Gil the Treacherous uses a 30" Chainsaw to Cut an opponent who is in Leather armor (LT). The ID of the Strike is (10) + 3; Gil rolls a 9, for a 12 ID hit. The Cutting Power is therefore 12 - 4 = 8 ID. Gil rolls a 50 for the Hit Location, and hits in the Upper Chest. Checking for an 8 ID hit against NO armor, this Strike does 100 PD times the damage multiplier of 6, for a total of 600 PD. On the next Impulse, if Gil decided to continue the Cut he would roll to hit using the normal odds. If he hit, he would again roll ID, and the Cutting Power would be equal to 8 (the old Cutting Power) plus the new ID (a ten-sided die plus 2) minus 2 (one-half the Armor Adjustment.)

Note that if the Cutting Power on any hit is less than or equal to 0, the blade is not penetrating the armor. That's what you get for trying to use a Chainsaw in combat.

"Have we found Louis?"

Blackjack

"Well, most of him."

Mojo Whiteleg

5.8

SURFACE CUTS

Certain weapons do not create the deep cuts which are modeled by the Cutting Damage Table. Instead, weapons like Broken Bottles, Whips, Razors, and Knives, when used for Slashing, cut along the surface of the target. Cuts like these can cause serious damage to an unarmored target, but will not bother an armored person.

To accurately model this type of damage, roll the Hit Location normally and enter the Cutting Damage Table with an ID equal to the attacker's Damage Bonus (DB), and read off the **Base PD**. If the target is armored, subtract 1 from the DB for LT armor, 2 for ML, 3 for BR, and 4 for PL. (I armor is of course immune to Surface Cutting.) If the PD is less than or equal to 0, then the Strike does no damage. If it is 1 or greater, then roll the ID given for the weapon, and multiply this number by the Base PD for the actual PD done. In essence, the ID roll represents the length of the cut, and the DB is used to represent its depth.

Example:

A combatant slashes an unarmored opponent with his Switchblade. He has a Damage Bonus of 1, and rolls a 52 for Hit Location. This is the Lower Chest. The Base PD done by 1 ID on the NO armor line is 3 PD. He rolls a 3 for his ID, and does 3 x 3 = 9 PD.

5.9

WHIPS

Under normal circumstances, Whips cannot be considered legitimate combat weapons, but they sometimes appear in gaming situations. Players who voluntarily choose to use a Whip in battle should be cautioned that, against an armed and armored opponent, it generally does not work the way they say it does in the movies.

Whips create **Surface Cuts**, as discussed above in Section 5.8, but use the **Blunt Hit Location and Damage Table (5D)** to find the Base PD. They can also be used to Entangle or Disarm an opponent.

Entanglement occurs when the Whip wraps securely around the Arm, Leg, or Head of the target. This is the option of the wielder; that is, any time he hits his opponent's Arm, Leg, or Head, he may elect to Entangle. The player must of course successfully hit, and Surface Cut damage is done normally as well. When a limb is Entangled, the target must treat that limb as being Disabled until it is released. Any person with an Entangled Head automatically loses 4 Combat Actions. The wielder may not Entangle any Hit Location on the target's torso.

Once the target is Entangled, the wielder may attempt to pull him off balance. Each attempt to pull an opponent off-balance takes two full Impulses, and uses the rules for Ramming (Section 5.2). The formula is 6 + 2 x (6) + Difference between the wielder's CF and the target's. As with Ramming, the target may lose Actions or even be Knocked Down, depending on how powerful the two parties are. If the target elects to counter this pull, then he may also roll against the wielder, as in a Collision, using the above formula. This sort of tug of war may continue indefinitely, with each combatant causing the other to lose Combat Actions, until one or the other is actually Knocked Down, the attacker lets go of the Whip, or until something else breaks the action. As with Rams and Collisions, if one of the two parties is not aware of the other's action, or elects to not counter, then his CF is treated as 0.

One possible way of ending a tug of war, and a viable option for a target who does not want to get into one or who would like regain the full use of his limb, is to cut the Whip. The Whip has a Defense Level of 0 and a Parry Column of 3, and is Cut in two by any Cutting Strike of 6 ID or greater (This type of solid Strike is necessary because the Whip will give and flex under the blow; if it is braced, only 2 ID are needed to cut it).

If the wielder of a Whip intends to Disarm his opponent, he must successfully hit the Forearm or Hand with the weapon in it. (See Aiming For Hit Locations, Section 5.15.) Surface Cut Damage is done normally, and there is a 10% chance per point of PD that the target will drop his weapon.

5.10

LODGED WEAPONS

In most cases a battle flows freely, with the combatants Striking and Parrying as they desire. Occasionally, however, a weapon gets caught in armor (or an opponent), and the wielder can lose precious time pulling it free. The **Lodged Weapons** rule reflects this.

The only weapons subject to Lodging are Stabbing weapons which have passed entirely through the target, and Cutting weapons. Flanged and Blunt weapons never become Lodged.

Cutting Weapons

An edged weapon has a 1% chance per point of ID over 10 of becoming Lodged in the target. That is, a Strike with 13 ID has a 3% chance of Lodging.

"...and if the Bayonet becomes stuck, you can always free the weapon by firing it."

Bayonet Pete

If the weapon does Lodge, then it is useless until it is freed; trying to free a weapon uses all of the Character's Actions for one Impulse and is considered a Striking Action for Parrying. The chance of the weapon remaining Lodged is small; subtract 5 times the Character's Damage Bonus from the previous Lodging %, and roll again. Subtract this amount each Impulse until the weapon comes free. If the Character does not want to free the weapon, he can elect to let go of it and use another one, or settle for using his free hand only.

If a Strike is being made at a target who is standing next to a tree or wood post, and the percentage rolled by the attacker indicates that the blow misses cleanly, then the weapon can become Lodged in the wood. A clean miss is a blow which would have missed even against a Column 1 Parry. If a weapon hits a tree, there is a 1% chance per point of ID of Lodging. The chance of freeing the weapon is the same as given above.

Stabbing Weapons

Stabbing weapons use the same rules as Cutting weapons to determine if they become Lodged in wood. For opponents, however, the rules are somewhat different.

A Stabbing weapon can only become Lodged if the point passes entirely through the opponent. As discussed earlier, this occurs at the last column where a PD is listed for a given Hit Location. For every point of ID greater than the number necessary to reach this column, there is a 10% chance of Lodging. The chance of the weapon remaining Lodged drops by 10% times the Character's Damage Bonus each Impulse.

5.11

BROKEN WEAPONS

Weapons that are properly cared for rarely break in the normal course of combat. This maintenance includes honing and tending edged weapons, and replacing worn spear hafts and such when necessary. Even when normal maintenance is being performed properly, however, there are situations which can lead to a broken weapon; these include having a weapon hit by a powerful Strike, particularly when it is Lodged or braced, and weapons suffering unusual wear and tear. The rules for these two situations are given below.

Breaking Lodged Weapons

A primary reason that weapons do not break in combat is that they move. That is, when one weapon is hit by another it is knocked aside, and this absorbs a great deal of momentum. If a weapon is Lodged when it is hit, however (Section 5.10), or is braced and immobile for some other reason, then it will absorb the full power of the Strike. If the Strike is powerful enough, then the Lodged weapon can be broken.

Any time a Strike hits a Lodged or braced weapon, the Striking player should determine the ID of the blow using the normal rules (If the Glancing rules of Section 5.1 are being used, then the blow Glances as a Stab against Plate). The target weapon will break if the ID of the Strike is greater than or equal to 40 if the target weapon is a Sword or other metal weapon, 30 for a Pole Arm, Heavy Spear, or Axe or Mace haft, and 20 for Light Spears, Sticks, and similar weapons.

Weapon Fatigue

As mentioned above, it is assumed that Spear hafts and other wooden parts of weapons are replaced when they become worn. Metal is more expensive, however, and is often used until broken. For this reason, it is sometimes necessary to note weapons that have been damaged.

Damage to a weapon happens when misuse or powerful impacts fatigue the metal, creating weaknesses which can cause it to snap under later stress. It is assumed that a weapon becomes **Fatigued** any time the wielder Strikes and rolls a 99, followed by a roll of greater than or equal to his Combat Skill Level on a ten-sided die. This represents radical misuse of the weapon.

A weapon can also become Fatigued when it is used to Parry a Strike of 40 ID or more. Whenever a combatant must Parry such a powerful Strike, he should roll percentile dice. On a roll of 99, followed by a roll of greater than or equal to his Combat Skill Level on a ten-sided die, the Parry has left the weapon Fatigued.

A Fatigued weapon will break the next time the wielder rolls a 99, either when taking a Strike (of any ID) or when Parrying a Strike of 40 ID or more. If a weapon becomes Fatigued a second time, then it will break on an 88 or 99; on a third Fatigue it will break on a 77, 88, or 99, and so forth.

5.12

FUMBLES

A trained, capable soldier will rarely mishandle his weapon, but during the chaos of combat it sometimes happens. For game purposes, it is assumed that a combatant will make a mistake on any Strike for which he rolls a 98, followed by a roll on a ten-sided die of greater than or equal to his Skill Level. Note that this means that combatants of 11th Skill Level or greater never mishandle their weapons.

In general, a **Fumble** just means that the combatant has dropped the weapon. Combatants wielding chain weapons or chainsaws, however, must roll less than or equal to their Agility on 3 six-sided dice, or else they hit themselves with their own weapon. The force of the blow is determined normally.

Example:

Donovan is 3rd Level, and would drop his Broadsword on any roll of 98, followed by a roll of 3 or greater on a ten-sided die.

5.13

DROPPED WEAPONS

When a weapon is hit by a particularly powerful impact, it can be dropped. There is a chance of this happening whenever a weapon is used to Parry, or if it either successfully performs or is hit by an Offensive Weapon Parry. This rule does not apply to Shields.

To determine the chance of a weapon being dropped, first calculate the ID of the Strike against it. If the Glancing rules of Section 5.1 are being used, the impact against the weapon Glances as a Stab against Plate. The chance of the weapon being dropped is found on the following **Weapon Drop Chance Table** by cross-indexing the ID and the defender's Skill Level. There are two parts to the Table. The left portion gives the **Drop Chance** for a One-Handed Weapon Parry while the right portion gives the Drop Chance for a Two-Handed Weapon Parry. If the defender rolls a 00 - 99 number less than or equal to the Drop Chance, he drops his weapon.

Example:

A Broadsword held by a 2nd Level combatant is hit with 12 points of Impact, after Glancing. The chance of the weapon being dropped is 5. The defender rolls a 00 - 99 number. If less than or equal to a 05 is rolled, he drops his weapon.

WEAPON DROP CHANCE TABLE

ID	One-Handed Weapon Parry Defensive Skill Level										Two-Handed Weapon Parry Defensive Skill Level									
	0	2	4	6	8	10	12	14	16	18	0	2	4	6	8	10	12	14	16	18
100																61	40	27	20	15
90										82					69	40	26	18	13	10
80			Dropped					94	68	51	Dropped			86	43	25	16	11	8	6
70			Weapon				79	55	40	30	Weapon			50	25	15	10	7	5	4
60						66	43	30	21	16			72	27	14	8	5	4	3	2
50					55	32	21	14	10	8			35	13	7	4	2	2	1	1
40				45	22	13	8	6	4	3		75	14	5	3	2	1	1	1	0
35			69	26	13	8	5	3	2	2		44	8	3	2	1	1	0	0	
30			37	14	7	4	3	2	1	1		24	4	2	1	0	0			
25		95	18	7	3	2	1	1	1	0	60	11	2	1	0					
20		39	7	3	1	1	1	0	0		25	5	1	0						
18		26	5	2	1	1	0				16	3	1							
16	84	16	3	1	1	0					10	2	0							
14	49	9	2	1	0						6	1								
12	27	5	1	0	0						3	1								
10	13	2	0	0							2	0								
8	5	1									1									
6	2	0									0									

5.14

CUTTING THROUGH PARRIES

It is possible for a Strike to carry through a Parry, by knocking aside the Shield or Weapon, and continue on to hit the target with a reduced impact. The chance of this happening depends on the force of the Strike, the strength of the Parry, and the Skill of the defender at deflecting the attack. Any time a player Strikes at an opponent who is not Dodging and misses, but rolls less than his Chance of Hitting against a Column 1 Parry, then he has hit the Parrying device.

Roll damage for the blow normally, including Glancing as if Stabbing against Plate. This ID is reduced by one of the following amounts.

For a Shield against a Stabbing blow, reduce the ID by 30.

For other blows, the attacker should roll an additional 00 - 99 number and compare it to the value found on the following **Cutting Through Parry Table** by cross-indexing the Strike's ID and the defender's Skill Level. If the roll is less than or equal to the value listed, the roll is the percent of the ID which carries through the Parry. If the roll is greater than the value listed, the Strike has been deflected. Note that there are two sides to the Table. The left side is for Strikes hitting a parrying device which is heavier than or of equal weight to the weapon, while the right is for parrying devices whose weight is less than the weapon.

The remaining ID are applied against the defender normally, including a second Glancing roll against the defender's armor.

Example:

Axly swings his Battleaxe at a 2nd Level opponent, who is parrying with a Short Sword. The blow does 60 ID, but Axly rolls a 6 for Glancing. This is .75 damage, so 45 ID go against the Short Sword. It weighs less than the Battleaxe, so the maximum amount that can go through is 80% of the ID (using the 40 ID line). Axly rolls a 55, so .55 X 45 (ID) = 25 ID carries through into the opponent.

CUTTING THROUGH PARRY TABLE																				
	Parry Weight Greater Than or Equal to Weapon Defensive Skill Level										Parry Weight Less Than Weapon Defensive Skill Level									
ID	0	2	4	6	8	10	12	14	16	18	0	2	4	6	8	10	12	14	16	18
100	95	92	88	61	34	21	15	10	8	6	95	92	88	85	82	79	77	57	43	33
90	94	91	87	42	23	15	10	7	5	4	94	91	87	83	80	77	55	39	29	23
80	93	90	65	28	16	10	7	5	3	3	93	90	85	81	77	63	36	26	19	15
70	92	89	41	18	10	6	4	3	2	2	92	89	83	78	53	33	22	16	11	9
60	91	87	24	10	6	3	2	2	1	1	91	87	80	57	31	19	12	9	6	5
50	89	54	13	5	3	2	1	1	1		89	84	70	29	16	9	6	4	3	2
40	87	25	6	2	1	1					87	80	32	13	6	4	2	1	1	1
35	66	16	4	1	1						85	77	19	8	4	2	1	1		
30	39	9	2	1							82	50	11	4	2	1				
25	21	5	1								79	26	5	2	1					
20	10	2									52	11	2	1						
18	7	1									36	7	1							
16	4	1									23	5	1							
14	3										14	3								
12	1										8	1								
10	1										4									
8											1									
6																				

AIMING AT SPECIFIC HIT LOCATIONS

In the normal rules, it is assumed that a person uses his Combat Actions as efficiently as possible. Because of this, Hit Locations are determined randomly; the attacker swings at whatever part of his opponent seems to be most vulnerable. Combatants who are higher Level than their targets may choose to aim at particular locations, however. This is governed by the following rules.

The chance of a desired Hit Location being open is based on the difference between the Combat Skill Levels of the attacker and defender, and the basic odds of hitting that location. Just multiply the percent chance of hitting a location, as shown on the appropriate Damage Table, by the number of Combat Skill Levels the attacker is higher than the defender. This is the percent chance of the chosen location being open. The attacker should roll a 00 to 99 number when he wishes to make a Strike.

If he rolls greater than this number, then the desired Hit Location is covered or otherwise defended, and the attacker may not Strike in that Impulse, or the next one. The attempt to find the desired Hit Location delays his Strike by 2 Impulses.

If he rolls less than or equal to the above number, then the desired Hit Location is open. He must now make his normal Odds of Hitting roll; if a hit is indicated, then it is in the desired Location. A miss is still a miss.

The preceding odds assume that the target is aware of the attack and is defending himself. If he is unaware or not defending himself, then treat his Combat Skill Level as 0 when determining the attacker's chance of hitting a particular location.

Example:

Donovan (3rd Level) is in combat with a 5th Level opponent who wishes to Strike at Donovan's head. With a Cutting blow, there is normally a 32% chance of hitting the head. If the attacker chose

"I tried to disable him. You know, a short chop to the forearm and he's out of the fight? But his neck got in the way."

Gil the Treacherous

to Aim at Donovan's Head, he would have a 64% chance of that Location being open, and would then use the normal Odds of Hitting to see if he connected. If he rolled a 65 or higher, he would not be able to Strike on the current Impulse and the next one. During this time he could take any other actions, but could not Strike.

Donovan could not normally choose a Hit Location against this opponent, but if he were Striking when the 5th Level was not aware, he would have 3 times the base chance of hitting a given Location.

5.16

PARRYING FOR ANOTHER COMBATANT

When a friend or ally is under attack from multiple opponents, or when a noncombatant is in danger, Characters may wish to aid them in their defense by Parrying for them. The rules governing Parrying for another person are as follows.

The Parrying Character must be within 1 hex of the person under attack, and must have a weapon or Buckler to Parry with. Parrying for another person costs 1 Action, and the attacker rolls his Odds of Hitting as if the Parrying Character were using a Partial Parry. If this attack "hits", then the Strike has passed the Parry and the attacker may attempt to hit his target as normal. Note that this means the attacker must make 2 Odds of Hitting rolls whenever someone Parries for someone else.

It is very hard to do this with a Shield larger than a Buckler. If a Character wants to use a larger Shield to Parry for another person, he must actually be in the same hex as the target. This is only possible if the target is crouching or prone, and if the target takes no Actions besides Covering Up.

5.17

SHIELD STRIKES

It is certainly possible for a combatant to use his Shield as an offensive weapon. Shield Strikes use all the normal combat rules, have a Range of 1, and cause the amount of Blunt Impact Damage shown on the following table. Thrusting Points and Cutting Edges added to shields are treated as normal weapons, using the Shield's Weapon Class - 2. Note that the Weapon Speeds in the table apply to Shield Strikes only; they are never used to determine how fast a Shield can Parry.

SHIELD STRIKE DATA

Shield	Weapon Speed (WS)	Weapon Class (WC)	Impact Damage (ID)
Buckler	1.8	- 3	(3)
Round	1.3	- 5	(4)
Heater	1.3	- 5	(4)
Kite	1.3	- 5	(4)
Scutem	1.0	- 7	(6)

5.18

ODDS OF HITTING MODIFIERS

Special situations such as terrain and stance can strongly affect the Odds of Hitting. There are two kinds of modifiers; to the Parry Column and to the Attack Level.

Parry Column Modifiers

When a combatant is defending from a superior position, it is easier for him to protect himself from attacks. For example, a warrior behind a low wall would no longer have to Parry blows aimed at his legs, while one defending a doorway would have some protection from Slashes. In game terms, this is represented by an increase in the defender's Parry Column and, in some cases, Defense Level.

The modifiers shown on the following table should be added to the defender's Parry Column. If this takes the Parry Column above 9, then the additional points should be added to the defender's Defense Level.

PARRY COLUMN MODIFIERS		
Target Situation	**Slashing Attack**	**Stabbing Attack**
In a Doorway	+ 2	0
In a Window	+ 3	+ 2
Behind a 3.5 Foot Wall	+ 2	+ 2
On Knees	+ 2	+ 2
Mounted versus Foot Soldiers	+ 1	+ 1
Part of a Shield Wall	+ 2	+ 2

"Well, I knew it was wrong, but I didn't think it mattered."

Axly

A combatant is considered part of a Shield Wall if he has a member of the same unit or team in the hexes to his left and right, and if all three have Shields (Round or larger). Note that the combatants on each end of a Shield Wall do not receive the Shield Wall bonus.

Example:

Donovan is behind a low wall and uses a Partial Parry with his Buckler against an incoming Strike. This would normally be a Column 4 Parry, but the Parry Column Modifier for being behind a wall is +2, and so his Parry Column is 6. If he chose to use a Full Parry (Column 9), then the +2 would be added to his Defense Level. Since Donovan is 3rd Level, this would let him defend using the Odds of Hitting Table for 5th Level.

Attack Level Modifiers

While Parry Column Modifiers are based on the ease with which the defender can Parry, Attack Level Modifiers come from the difficulties faced by the attacker. The modifiers on the following table are penalties to the Attack Level of the attacker.

ATTACK LEVEL MODIFIERS			
Target Situation	**Slash with Bladed Weapon**	**Slash with Impact Head**	**Stabbing Points**
Back to Wall, Tree, etc.	- 2	0	0
On a Ladder	- 2	0	0
Prone	- 2	0	0
Visibility	- V / 10	- V / 10	- V / 10
Heavy Brush or Jungle	- 2 X R	- 2 X R	- R / 2

"OK, I knew it mattered, but I didn't think anyone would notice."

Axly

The penalties which apply to Slashes with blades represent the difficulty of Striking with only the tip of the weapon, in an attempt to avoid a wall, the ground, or whatever. This modifier applies to any weapon with a long striking surface, including Swords, Bayonets, Sticks, and so forth. Slashing weapons with Impact Heads, such as Maces, Axes, and Rifle Butts, do not suffer from this limitation. Note that bladed Slashing weapons will only do Tip Hit damage, as defined in Section 1.2, Step 9.

The "V" modifier in the Visibility line above represents the percent of darkness surrounding the conflict, ranging from 0, with a well-lit battlefield, to 100, for battles fought in complete darkness. People with special equipment may be partially or completely immune to this modifier.

The "R" modifier is the Range of the weapon; longer weapons are harder to use in close quarters.

USING THIS SYSTEM WITH PCCS

Obviously this game has been designed to be easy to use with the **Phoenix Command Combat System**. Combining the two is straightforward; the most immediate questions are answered below.

The biggest difference between PCCS and the Hand-to-Hand System is the scale. PCCS uses a 6 foot hex (or 6 feet per inch), while Hand-to-Hand uses a scale of 2 feet per hex. **Figure 4** shows how these two scales can be superimposed. When necessary, play should be transferred to the Hand-to-Hand scale. For combatants who are not in Hand-to-Hand, the normal PCCS scale is used.

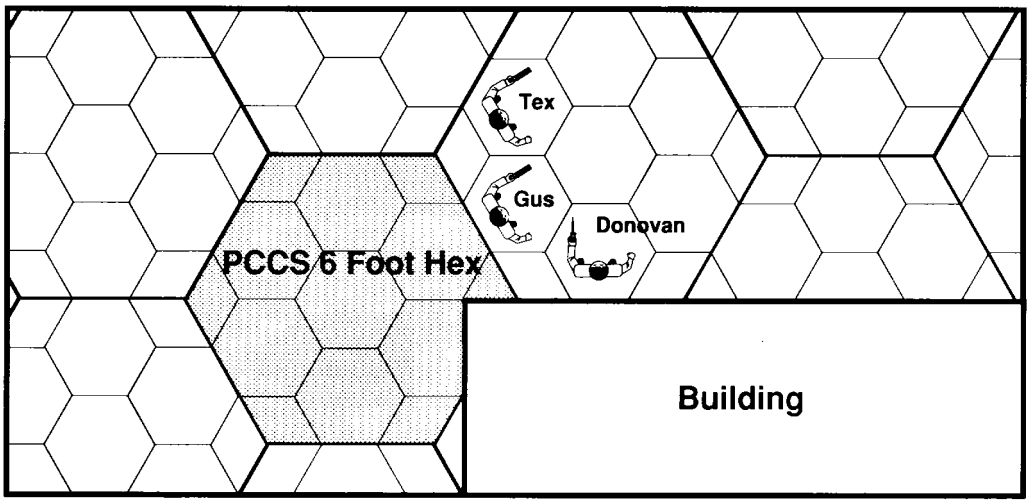

Figure 4: Combat Example

"Even if they noticed, I didn't think they would know it was me."

Axly

The major difference remaining is that the Hand-to-Hand System incorporates Acceleration and Deceleration times during Movement. Those rules are used to cover the details of Hand-to-Hand combat on the 2 feet per hex scale. When using Hand-to-Hand with PCCS, the Acceleration and Deceleration rules are normally ignored, and combatants are free to Accelerate immediately into Planned Movement. This means they can move at the same speed that opponents using the PCCS scale move, 6 feet per Action. Additionally, when play transfers from the PCCS scale to the Hand-to-Hand scale, the combatants are placed on the map without their initial velocities. In this way Hand-to-Hand and PCCS play together in a natural flow from Impulse to Impulse.

For those using the Master Phasing Count of PCCS Section 5.7, Hand-to-Hand action should be resolved normally each Impulse.

The following example demonstrates the full integration of the two systems.

Example:

Donovan has expended all his ammunition and has pulled a K-Bar Knife. He is hiding behind the corner to an alley as two opponents, Gus and Tex, run around the corner. When Gus and Tex enter Donovan's hex, he attacks.

The game was being played on the normal PCCS scale of 6 feet per hex, but the Hand-to-Hand combat will be resolved on the 2 feet per hex scale. The Referee marks off 7 hexes (Figure 4) and places the combatants. Donovan is against the wall as the 2 opponents enter the hex.

Gus and Tex are running and have used all their CA for the Impulse. Donovan has 1 CA available in the Impulse. He uses this Action to take a Strike at Gus. Donovan has had time to be fully Set and takes a Long Stroke Stab. Gus has a Pistol, which is a 1 Handed Weapon. Since he is in Planned Movement, he has a Partial Parry of 4 (Partial Parry) - 2 (Planned Movement) = 2. Gus is 2nd Hand-to-Hand Skill Level and Donovan's Attack Level (AL) is 5 (Hand-to-Hand Skill Level of 3 plus Weapon Class of +2). Donovan hits automatically. Donovan's Damage Bonus is 1.5 and he rolls a 2 for Stabbing ID. The blow's IDs = 2 X 1.5 (DB) = 3. Donovan rolls a 45 for Hit Location and hits his unarmored opponent in the Intestines doing 75 PD. Gus fails his KV roll and is Incapacitated.

On the next Impulse, Donovan gets 2 CA and Tex receives 1 CA. Donovan uses his Free Movement to step one hex forward (1AC) and turn 60° toward Tex (1AC). At the same time, Donovan Recovers his blow and takes a Short Stab at Tex. Tex takes a Snap Shot at Donovan. Tex has an EAL = 33 (Range 0 to 1) + 9 (SAL) - 6 (hip fire) - 4 (pistol in one hand) - 18 (Snap Fire Aim Time Mod) - 6 (Donovan moving .5 HPI) + 7 (Low Crouch TS ALM) = 15. Tex needs a 33 to hit; he rolls a 23 and hits, Incapacitating Donovan.

Donovan's blow Strikes as Tex fires his weapon. This use of Tex's pistol is treated as a Strike, so Tex receives a Column 2 Parry against Donovan's blow. Donovan hits and Incapacitates Tex, leaving all three combatants seriously wounded.

If the Referee wishes, the game on the Hand-to-Hand scale can be run using full Acceleration and Deceleration rules, and combatants moving from one scale to the other could either keep their Velocities or enter play at a Movement Speed of 0. In the preceding example, the two opponents could enter the map at their MS; Donovan would take a Passing Blow at Gus as he went by. Play would continue with Tex either continuing on, or Decelerating and turning to shoot Donovan.

PHOENIX COMMAND HAND-TO-HAND COMBAT STATUS SHEET

Name:

Characteristics

Strength	STR
Intelligence	INT
Will	WIL
Health	HLT
Agility	AGI
Base Speed	
Maximum Speed	MS
Gun Combat Skill Level	
Hand-to-Hand Skill Level	
Skill Accuracy Level	SAL
Combat Efficiency	CE
INT Skill Factor	ISF
AGI Skill Factor	ASF
Combat Actions	
Gun Combat	CA
Hand-Hand	CA
Damage Bonus	DB

COMBAT ACTIONS PER IMPULSE

	Impulse			
	1	2	3	4
Gun Combat				
Hand-to-Hand				

Knockout Value KV

Body Armor	PF	BPF	Armor Class	Weight
Helm:				
Visor:				
Body:				
Arms:				
Legs:				

Equipment

Physical Status

PD Total:

Disabling Injuries:

Ammunition:

KNOCKOUT TABLE

PD Total	Odds
Under KV / 10	00
Over KV / 10	10
Over KV	25
Over 2 X KV	75
Over 3 X KV	98

GUN COMBAT DATA

Weapon		Aim Time	Shot Accuracy	Target Range in hexes: 10	20	40	70	100	200	300	400
	L	1		FMJ PEN							
	W	2		DC							
		3									
	RT	4		JHP PEN							
	ROF	5		DC							
	Cap	6									
	AW	7		AP PEN							
		8		DC							
	KD	10									
	SAB	12		MA							

HAND-TO-HAND WEAPON DATA

Weapon	Weap Speed (WS)	Weap Class (WC)	Attack Level (AL)	Action Costs: Parry	Set	Strike	Recvr	Impact Damage: Cutting (IDc)	Stabbing (IDs)	Range 2' hex

ARCHAIC WEAPON DATA TABLE / 1A

Medieval Weapons	Weight	Weapon Speed (WS)	Weapon Class (WC)	Cutting (IDc)	Stabbing (IDs)	Range 2 Foot Hexes
ONE-HANDED WEAPONS						
Dagger	1.1	2.8	+2	(3) + 2	(3)	1
Wakizashi	1.8	2.5	+1	(5) + 2	(3)	1
Short Sword	1.7	2.7	+1	(4) + 2	(3)	1
Rapier	1.8	2.7	+1	(2) + 1	(3)	2+
Saber	2.6	2.3	0	(5) + 2	(3)	2+
Broadsword	3.6	2.2	0	(6) + 2	(3)	2
Used in Two Hands		2.3	0	(10) + 2	(5)	2
Scimitar	3.7	2.0	0	(6) + 3	(3)	2+
Used in Two Hands		2.1	0	(10) + 3	(5)	2+
Cutlass	3.1	2.3	0	(5) + 2	(3)	1+
Used in Two Hands		2.4	0	(8) + 2	(4)	1+
Hand and a Half Sword	4.6	2.0	-1	(6) + 2	(3)	2+
Used in Two Hands		2.1	-1	(10) + 4	(5)	2+
Axe or Mace	3.3	2.1	-2	(4) + 4	(3)	1
Used in Two Hands		2.1	-2	(6) + 6	(4)	1
Lance at Charge	9.2	—	—	—	(10) x (3)	5
TWO-HANDED WEAPONS						
Katana	3.0	2.2	0	(10) + 4	(5)	2
Used in One Hand		2.1	0	(5) + 2	(3)	2
No-Dachi	6.8	1.6	-4	(12) + 6	(6)	3
Two Handed Sword	5.9	2.0	-1	(12) + 5	(6)	2+
Great Sword	5.8	1.6	-4	(12) + 6	(6)	3
Battleaxe	4.6	1.8	-3	(8) + 7	(5)	2
Light Spear	3.0	2.1	-2	—	(5)	4
Used in One Hand		2.0	-2	—	(3)	3
Mounted Charge		—	—	—	(12)	3
Heavy Spear	5.0	1.8	-3	—	(6)	4
Used in One Hand		1.7	-4	—	(4)	3
Mounted Charge		—	—	—	(20)	3
Glaive or Naginata	6.2	1.1	-9	(12) + 8	(6)	3 - 4
Choked Grip		1.6	-4	(12) + 7	(6)	1 - 2
Halberd or Poleaxe	5.8	1.2	-8	(12) + 8	(6)	3 - 4
Choked Grip		1.6	-4	(12) + 7	(6)	1 - 2
BLUNT IMPACT WEAPONS						
Club	2.2	2.2	0	(4) + 3	(3)	1
Used in Two Hands		2.4	0	(10) + 5	(5)	1
Quarterstaff	3.4	2.2	0	(8) + 4	(5)	2
Long Grip		2.1	-1	(12) + 5	(5)	3
Mace and Chain	4.2	1.6	+2	(6) + 4	—	2
Used in Two Hands		2.0	+2	(12) + 6	—	2
Nunchaku	2.1	2.1	+1	(4) + 2	—	1+
Stick	2.0	2.5	0	(4) + 2	(3)	2
Used in Two Hands		2.6	0	(10) + 5	(5)	2
Rock	1.5	2.6	0	(6) + 2	—	1
Used in Two Hands	10.0	1.4	-5	(10) + 5	—	1

Modern Weapons	Weight	Weapon Speed (WS)	Weapon Class (WC)	Cutting (IDc)	Stabbing (IDs)	Range 2 Foot Hexes
Baseball Bat	2.2	2.5	+1	(4) + 2	(3)	2
Used in Two Hands		2.6	+1	(10) + 3	(5)	2
Billyclub, Tonfa	.5	2.8	+2	(3) + 1	(3)	1
Blackjack	.5	2.8	0	(5)	—	1
Bottle	1.3	2.8	+1	(3) + 2	(3)	1
Hollywood Type		2.8	+1	(2)	—	1
Bullwhip	2.0	1.0	0	(6)	—	5
Chain	3.0	2.0	+2	(6) + 2	—	2
Used in Two Hands		2.2	+2	(10) + 2	—	2
Chainsaws						
18 Inch	19.5	1.5	-8	(8) + 2	(6) + 1	1+
30 Inch	27.3	1.0	-10	(10) + 3	(6) + 3	2
Chair (2 Hands)	15.0	1.0	-12	(12) + 8	(6)	2
Hollywood Type		1.0	-12	(5)	—	2
Cleaver or Hatchet	2.5	2.3	-1	(4) + 3	(3)	1
Used in Two Hands		2.3	-1	(6) + 5	(4)	1
Crowbar	2.5	2.3	0	(6) + 2	(3)	1+
Used in Two Hands		2.4	0	(10) + 4	(5)	1+
Entrenching Tool	1.8	2.5	-1	(3) + 3	(3)	1
Used in Two Hands		2.6	-1	(5) + 5	(4)	1
Hammer 14 Ounce	1.5	2.6	-1	(3) + 3	(3)	1
Used in Two Hands		2.7	-1	(6) + 3	(3)	1
Hammer 2 pound	2.3	2.4	-2	(4) + 3	(3)	1
Used in Two Hands		2.5	-2	(6) + 5	(4)	1
Knives						
Pocket	.3	2.9	+2	(2) + 1	(3)	1
Switch Blade	.3	2.9	+2	(2) + 1	(3)	1
K-Bar	.6	2.8	+2	(3) + 1	(3)	1
Bowie / Survival	1.1	2.8	+2	(3) + 2	(3)	1
Machete	2.4	2.3	0	(6) + 2	(3)	1
Used in Two Hands		2.4	0	(10) + 3	(3)	1
Pipe 24 inch	2.2	2.5	0	(4) + 2	(3)	1+
Used in Two Hands		2.6	0	(10) + 3	(4)	1+
Pipe Wrench 12 inch	3.3	2.1	-2	(4) + 4	(3)	1
Scissors	.2	2.7	+1	—	(3)	1
Screwdriver or Ice Pick	.2	2.9	+2	—	(3)	1
Sledge Hammer 6 pound	7.5	1.0	-9	(10) + 10	(6)	2
Two by Four	3.0	2.4	0	(5) + 2	(3)	2
Used in Two Hands		2.5	0	(8) + 4	(5)	2
Wood Axe (2 Hands)	3.5	1.7	-2	(10) + 6	(5)	2
SMALL ARMS WEAPONS						
Pistol	2.4	2.4	0	(6) + 3	—	1
Light Rifle with Bayonet	8.0	1.9	-1	(6) + 3	(6) + 2	2+
Heavy Rifle with Bayonet	11.2	1.8	-2	(8) + 3	(6) + 3	2+
Sub-Machinegun	6.8	2.0	-1	(6)	(6) + 1	2

BASE SPEED TABLE / 2A

STR	Encumbrance 10	15	20	25	30	35	40	45	50	55	60	70	80	90	100	125	150	200
21	4.5	4.5	4	4	4	3.5	3.5	3.5	3.5	3.5	3	3	3	3	3	2.5	2.5	2
20	4.5	4	4	3.5	3.5	3.5	3.5	3.5	3	3	3	3	3	2.5	2.5	2.5	2.5	2
19	4	4	3.5	3.5	3	3	3	3	3	2.5	2.5	2.5	2.5	2.5	2	2	2	1.5
18	4	3.5	3.5	3	3	3	2.5	2.5	2.5	2.5	2.5	2	2	2	2	1.5	1.5	1.5
17	3.5	3	3	3	2.5	2.5	2.5	2.5	2	2	2	2	2	1.5	1.5	1.5	1.5	1
16	3.5	3	2.5	2.5	2.5	2.5	2	2	2	2	2	1.5	1.5	1.5	1.5	1	1	1
15	3	3	2.5	2.5	2	2	2	2	2	1.5	1.5	1.5	1.5	1.5	1	1	1	
14	3	2.5	2.5	2	2	2	2	1.5	1.5	1.5	1.5	1.5	1.5	1	1.	1	1	
13	3	2.5	2.5	2	2	2	1.5	1.5	1.5	1.5	1.5	1.5	1	1	1	1		
12	3	2.5	2	2	2	2	1.5	1.5	1.5	1.5	1.5	1	1	1	1			
11	3	2.5	2	2	2	2	1.5	1.5	1.5	1.5	1.5	1	1	1	1			
10	3	2.5	2	2	2	2	1.5	1.5	1.5	1.5	1.5	1	1	1	1			
9	3	2.5	2	2	2	2	1.5	1.5	1.5	1.5	1.5	1	1	1	1			
8	3	2.5	2	2	2	1.5	1.5	1.5	1.5	1.5	1.5	1	1	1	1			
7	2.5	2.5	2	2	2	1.5	1.5	1.5	1.5	1.5	1.5	1	1	1	1			
6	2.5	2.5	2	2	2	1.5	1.5	1.5	1.5	1.5	1	1	1	1	1			
5	2.5	2.5	2	2	1.5	1.5	1.5	1.5	1.5	1	1	1	1	1				
4	2.5	2	2	1.5	1.5	1.5	1.5	1	1	1	1	1						
3	2.5	2	1.5	1.5	1.5	1	1	1	1	1	1							
2	2	1.5	1.5	1.5	1	1	1	1										
1	1.5	1.5	1															

MAXIMUM SPEED TABLE / 2B

AGI	Base Speed 1	1.5	2	2.5	3	3.5	4
21	2	4	5	7	9	10	12
20	2	4	5	7	8	10	11
19	2	4	5	7	8	10	11
18	2	4	5	6	8	9	11
17	2	3	5	6	8	9	10
16	2	3	5	6	8	9	10
15	2	3	5	6	7	9	10
14	2	3	4	6	7	8	9
13	2	3	4	6	7	8	9
12	2	3	4	5	7	8	9
11	2	3	4	5	6	7	8
10	2	3	4	5	6	7	8
9	2	3	4	5	6	7	8
8	2	3	4	4	5	6	7
7	2	3	3	4	5	6	7
6	2	2	3	4	5	5	6
5	1	2	3	4	4	5	6
4	1	2	3	3	4	4	5
3	1	2	2	3	3	4	4
2	1	1	2	2	3	3	4
1	1	1	1	2	2	2	3

COMBAT EFFECTIVENESS

Skill Level	CE
0	0
1	5
2	7
3	9
4	10
5	11
6	12
7	13
8	14
9	15
10	16
11	17
12	18
13	19
14	20
15	21
16	22

COMBAT ACTIONS (CA) / DAMAGE BONUS (DB) TABLE / 2D

ASF = AGI + Combat Efficiency

MS	Agility Skill Factor (ASF) 7	9	11	13	15	17	19	21	23	25	27	29	31	33	35	37	39
1	1	1	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2
	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5
2	1	1	1	2	2	2	2	2	2	3	3	3	3	3	3	4	4
	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	.5	1
3	1	2	2	2	3	3	3	3	4	4	4	4	5	5	5	5	6
	.5	.5	.5	.5	.5	.5	1	1	1	1	1	1	1	1	1	1	1
4	2	2	3	3	4	4	4	5	5	5	6	6	6	7	7	7	7
	.5	.5	1	1	1	1	1	1	1	1	1	1.5	1.5	1.5	1.5	1.5	2
5	2	3	3	4	4	5	5	6	6	7	7	7	8	8	8	9	9
	.5	1	1	1	1	1	1.5	1.5	1.5	1.5	2	2	2	2.5	2.5	2.5	2.5
6	3	3	4	5	5	6	6	7	7	8	8	9	9	10	10	11	11
	1	1	1	1.5	1.5	1.5	2	2	2	2.5	2.5	3	3	3	3.5	3.5	4
7	3	4	5	5	6	7	7	8	9	9	10	10	11	11	12	12	13
	1	1	1.5	1.5	2	2	2.5	2.5	3	3	3.5	3.5	4	4	4.5	4.5	5
8	3	4	5	6	7	8	9	9	10	11	11	12	12	13	14	14	15
	1	1.5	2	2	2.5	2.5	3	3.5	3.5	4	4.5	4.5	5	5.5	5.5	6	6.5
9	4	5	6	7	8	9	10	10	11	12	13	13	14	15	15	16	17
	1.5	2	2	2.5	3	3.5	4	4	4.5	5	5.5	6	6	6.5	7	7.5	8
10	4	6	7	8	9	10	11	12	12	13	14	15	16	16	17	18	18
	2	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	8.5	9	9.5
11	5	6	7	9	10	11	12	13	14	15	15	16	17	18	19	19	20
	2	2.5	3	3.5	4.5	5	5.5	6	6.5	7.5	8	8.5	9	9.5	10	11	12

CA PER IMPULSE

CA	Impulse 1	2	3	4
1	1			
2	1		1	
3	1		1	1
4	1	1	1	1
5	2	1	1	1
6	2	1	2	1
7	2	1	2	2
8	2	2	2	2
9	3	2	2	2
10	3	2	3	2
11	3	2	3	3
12	3	3	3	3
13	4	3	3	3
14	4	3	4	3
15	4	3	4	4
16	4	4	4	4
17	5	4	4	4

ARMOR DATA TABLE / 3A

Armors	Armor Class	BPF	Armor Weights Total	Head	Visor	Body	Arms	Legs
Medieval								
Clothing	NO	0	5.0	–	–	2.0	1.0	2.0
Leather								
Untreated	LT	2	17.0	2.0	–	5.0	3.5	6.5
Hardened	ML	2	29.0	3.0	–	9.0	6.0	11.0
Mail								
Light	LT	2	26.0	3.0	–	7.5	5.5	10.0
Regular	ML	2	29.0	3.5	–	8.5	6.0	11.0
Double	BR	3	56.0	7.0	–	16.0	12.0	21.0
Brigandine	BR	3	45.5	5.5	–	13.5	9.5	17.0
Scale	BR	3	56.8	6.6	–	16.8	11.8	21.6
Plate	PL	3 +	54.0	6.0	1.0	16.0	11.0	20.0
Modern								
Clothing	NO	0	5.0	–	–	2.0	1.0	2.0
Flexible								
Light	LT	1	2.0	–	–	2.0	–	–
Medium	ML	1	2.6	–	–	2.6	–	–
Heavy	BR	2	3.2	–	–	3.2	–	–
Flak Vest	I	3	10.3	–	–	10.3	–	–
Police Helmet	LT	2	2.5	2.5	–	–	–	–
Rigid								
Light	I	4	15.4	3.1	.8	11.5	–	–
Medium	I	5	19.8	4.0	.8	15.0	–	–
Heavy	I	6	24.0	–	–	24.0	–	–
High Tech								
Flexible								
Light	LT	1	2.0	–	–	2.0	–	–
Medium	ML	1	2.5	–	–	2.5	–	–
Heavy	BR	2	3.0	–	–	3.0	–	–
Combat Suit	LT	1	7.4					
Level 1	LT - BR	1 - 3	13.9					
Level 2	LT - I	1 - 5	29.3					
Level 3	LT - I	1 - 6	37.1					
Level 4	LT - I	1 - 6	47.1					
Level 5	LT - I	1 - 7	56.2					
DRGN Suit	ML	1	10.0					
Power Armor	I	8 - 10	Var					

UNARMED COMBAT TABLE / 3B

Attacker's Action	ID	Action Cost	Weapon Class
Strike			
Fist	0 - 1	1	+ 2
Elbow	0 - 1	1	0
Knee	0 - 1	2	0
Kick	0 - 2	2	0
Head Butt	0 - 1	1	- 2
Recover			
Fist		1	
Elbow		1	
Knee		2	
Kick		2	
Head		2	
Set			
Fist		1	
Elbow		2	
Knee		2	
Kick		3	
Head Butt		2	
Block		1	
Dodge		4 Imp	
Cover Up		1 Imp	

PARRY DATA TABLE / 3C

Parry Device	Weight	Partial Parry (PP)
One Handed Weapon	Var	4
Two Handed Weapon	Var	5
Buckler Shield	4.6	4
Round Shield	10.0	5
Heater Shield	9.7	6
Kite Shield	11.2	7
Scutem Shield	23.1	8
Dodge		MS - 1
Cover Up		PP + 1

ACTION TIME TABLE / 3D

Action Cost	Free Movement Actions
1	Move Forward 1 hex
2	Move Oblique 1 hex
3	Move Backward 1 hex
1	60° Facing Change While Moving
1	60° Facing Change Stationary

Action Cost	Action
2	Draw a sheathed weapon
3	Draw a slung weapon
4	Pick Up a weapon from ground
2	Switch Hands with a weapon
1	Change Grip (close - long)
1	Change Grip (1 - 2 Hand)
3	Rotate Axe (blade - beak)
3	Recover Defense after Knockdown
2	Prone to Kneeling
3	Prone to Standing

Action	Get Out	Put On	Take Off
Arming			
Helmet	4	8	4
Close Visor	-	1 - 2	3
Gauntlet	2	3	2
Shield	8	6	3
Buckler	4	2	1
Fix Bayonet	2	3	3

ODDS OF HITTING TABLE / 4

Defensive Skill Level 0

AL	Parry Class 9	8	7	6	5	4	3	2	1
-9	21	22	23	24	26	27	29	31	32
-8	24	25	26	27	28	30	32	35	36
-7	26	28	29	30	32	33	36	39	40
-6	29	31	32	34	35	37	40	43	44
-5	33	34	36	38	39	41	44	48	49
-4	36	38	40	42	44	46	49	53	55
-3	40	42	45	47	49	51	55	59	61
-2	45	47	50	52	54	56	61	66	68
-1	50	53	55	58	60	63	68	73	76
0	56	58	61	64	67	70	75	81	84
1	62	65	68	71	74	78	84	90	93
2	69	72	76	79	83	86	93		
3	76	80	84	88	92	96			
4	85	89	94	98					
5	94								
6									
7									
8									
9									
10									
11									
12									
13					HIT				
14									
15									
16									
17									
18									
19									
20									

Defensive Skill Level 1

AL	Parry Class 9	8	7	6	5	4	3	2	1
-9	14	16	17	19	21	23	27	30	32
-8	15	17	19	22	24	26	30	34	36
-7	17	19	22	24	26	29	33	38	40
-6	19	22	24	27	29	32	37	42	44
-5	21	24	27	30	33	35	41	47	49
-4	24	27	30	33	36	39	46	52	55
-3	27	30	34	37	40	44	51	58	61
-2	30	33	37	41	45	49	56	64	68
-1	33	37	42	46	50	54	63	71	76
0	37	41	46	51	56	60	70	79	84
1	41	46	51	57	62	67	78	88	93
2	45	51	57	63	69	75	86	98	
3	51	57	64	70	76	83	96		
4	56	63	71	79	86	94			
5	63	71	79	86	94				
6	70	78	87	96					
7	77	87	97						
8	86	97							
9	96								
10									
11									
12									
13					HIT				
14									
15									
16									
17									
18									
19									
20									

Defensive Skill Level 2

AL	Parry Class 9	8	7	6	5	4	3	2	1
-9	9	11	14	16	18	21	25	30	32
-8	10	13	15	18	20	23	28	33	36
-7	11	14	17	20	23	26	31	37	40
-6	12	16	19	22	25	28	35	41	44
-5	14	17	21	25	28	32	39	46	49
-4	16	20	23	27	31	35	43	51	55
-3	17	22	26	31	35	39	48	57	61
-2	19	24	29	34	39	44	53	63	68
-1	22	27	32	38	43	49	59	70	76
0	24	30	36	42	48	54	66	78	84
1	27	34	40	47	53	60	73	87	93
2	30	37	45	52	59	67	82	96	
3	33	42	50	58	66	74	91		
4	37	46	55	64	74	83			
5	41	51	62	72	82	92			
6	46	57	68	80	91				
7	51	64	76	89					
8	57	71	85	98					
9	63	79	94						
10	70	87							
11	78	97							
12	87								
13	97				HIT				
14									
15									
16									
17									
18									
19									
20									

Defensive Skill Level 3

AL	Parry Class 9	8	7	6	5	4	3	2	1
-9	6	8	11	14	16	19	24	30	32
-8	6	9	12	15	18	21	27	33	36
-7	7	10	14	17	20	24	30	37	40
-6	8	12	15	19	23	26	34	41	44
-5	9	13	17	21	25	29	37	45	49
-4	10	15	19	24	28	33	45	51	55
-3	11	16	21	26	31	36	46	56	61
-2	13	18	24	29	35	40	51	62	68
-1	14	20	26	33	39	45	57	69	76
0	16	23	29	36	43	50	64	77	84
1	18	25	33	40	48	56	71	86	93
2	20	28	37	45	53	62	79	95	
3	22	31	41	50	59	69	87		
4	25	35	45	56	66	76	97		
5	27	39	50	62	73	85			
6	30	43	56	69	81	94			
7	34	48	62	76	91				
8	38	53	69	85					
9	42	59	77	94					
10	47	66	86						
11	52	74	95						
12	58	82							
13	64	91							
14	72								
15	80								
16	88				HIT				
17	98								
18									
19									
20									

Defensive Skill Level 4

AL	Parry Class 9	8	7	6	5	4	3	2	1
-9	3	6	9	12	15	18	24	29	32
-8	4	7	10	13	17	20	26	33	36
-7	4	8	12	15	19	22	29	36	40
-6	5	9	13	17	21	25	33	40	44
-5	6	10	14	19	23	28	36	45	49
-4	6	11	16	21	26	31	40	50	55
-3	7	13	18	23	29	34	45	56	61
-2	8	14	20	26	32	38	50	62	68
-1	9	16	22	29	36	42	56	69	76
0	10	18	25	32	40	47	62	77	84
1	11	20	28	36	44	52	69	85	93
2	13	22	31	40	49	58	76	95	
3	14	24	35	45	55	65	85		
4	16	27	38	50	64	72	94		
5	18	30	43	55	68	80			
6	20	34	48	61	75	89			
7	22	38	53	68	84				
8	25	42	59	76	93				
9	28	47	65	84					
10	31	52	73	94					
11	34	58	81						
12	38	64	90						
13	43	71							
14	47	79							
15	53	89							
16	59	98			HIT				
17	65								
18	72								
19	80								
20	89								

Defensive Skill Level 5

AL	Parry Class 9	8	7	6	5	4	3	2	1
-9	2	5	8	11	14	17	23	29	32
-8	2	6	9	12	16	19	26	33	36
-7	3	6	10	14	18	21	29	36	40
-6	3	7	11	15	20	24	32	40	44
-5	3	8	13	17	22	26	36	45	49
-4	4	9	14	19	24	29	40	50	55
-3	4	10	16	21	27	33	44	55	61
-2	5	11	18	24	30	37	49	62	68
-1	6	13	20	27	34	41	55	69	76
0	6	14	22	30	37	45	61	76	84
1	7	16	25	33	42	50	68	85	93
2	8	18	27	37	46	56	75	94	
3	9	20	30	41	52	62	83		
4	10	22	34	46	57	69	93		
5	12	25	38	51	64	77			
6	13	27	42	56	71	85			
7	15	31	47	63	79	95			
8	16	34	52	70	88				
9	18	38	58	78	97				
10	20	42	64	86					
11	23	47	71	96					
12	25	52	79						
13	28	58	88						
14	31	65	98						
15	35	72							
16	39	80			HIT				
17	89	93							
18	48								
19	53								
20	59								

Defensive Skill Level 6

AL	Parry Class 9	8	7	6	5	4	3	2	1
-9	1	4	7	10	13	17	23	29	32
-8	1	4	8	11	15	19	26	32	36
-7	1	5	9	13	17	21	28	36	40
-6	2	6	10	14	19	23	30	40	45
-5	2	7	11	16	21	26	35	45	49
-4	2	8	12	18	23	29	39	50	55
-3	3	9	14	20	26	32	44	55	61
-2	3	10	16	23	29	36	49	61	69
-1	4	11	18	25	32	40	54	68	76
0	4	12	20	28	36	44	60	76	84
1	5	13	22	31	40	49	67	84	93
2	5	15	25	35	45	54	74	94	
3	6	17	28	39	50	61	82		
4	7	19	31	43	55	67	92		
5	7	21	34	48	61	75			
6	8	23	38	63	68	83			
7	9	26	43	59	76	92			
8	11	29	47	66	84				
9	12	32	53	73	94				
10	13	36	59	81					
11	15	40	65	90					
12	17	45	73						
13	18	50	81				HIT		
14	21	55	90						
15	23	61							
16	26	68							
17	29	76							
18	32	84							
19	35	94							
20	39								

Defensive Skill Level 7

AL	Parry Class 9	8	7	6	5	4	3	2	1
-9	0	4	7	10	13	16	23	29	32
-8	0	4	7	11	14	18	25	32	36
-7	1	5	8	12	16	20	28	36	40
-6	1	5	9	14	18	22	31	40	45
-5	1	6	11	16	20	25	35	45	49
-4	1	6	12	17	22	28	39	50	55
-3	1	7	13	19	25	31	43	55	61
-2	2	8	15	22	28	35	48	61	68
-1	2	9	17	24	31	39	54	68	76
0	2	11	19	27	35	43	60	76	84
1	3	12	21	30	39	48	66	84	93
2	3	13	23	33	43	53	74	94	
3	4	15	26	37	48	59	82		
4	4	17	29	41	54	66	91		
5	5	18	32	46	60	73			
6	5	21	36	51	66	82			
7	6	23	40	57	74	91			
8	7	26	44	63	82				
9	8	29	49	70	91				
10	9	32	55	78					
11	10	35	61	87					
12	11	39	68	97					
13	12	44	76				HIT		
14	14	49	84						
15	15	54	93						
16	17	60							
17	19	67							
18	21	75							
19	24	83							
20	26	92							

Defensive Skill Level 8

AL	Parry Class 9	8	7	6	5	4	3	2	1
-9	0	3	6	10	13	16	23	29	32
-8	0	3	7	11	15	18	26	32	36
-7	0	4	8	12	16	20	28	36	40
-6	0	4	9	13	18	22	31	30	45
-5	0	5	10	15	20	25	35	45	49
-4	0	6	11	17	22	28	39	49	55
-3	1	7	13	19	25	31	43	55	61
-2	1	8	14	21	28	34	48	61	68
-1	1	9	16	23	31	38	53	68	76
0	1	10	18	26	34	43	59	76	84
1	2	11	20	29	38	47	66	84	93
2	2	12	22	32	43	53	73	94	
3	2	13	25	36	47	59	81		
4	2	15	28	40	53	65	90		
5	3	17	31	45	59	73			
6	3	19	34	50	65	81			
7	4	21	38	55	72	90			
8	4	23	42	61	81				
9	5	26	47	68	89				
10	6	29	52	76					
11	6	32	58	84					
12	7	36	65	94					
13	8	40	72				HIT		
14	9	45	80						
15	10	50	89						
16	11	55							
17	13	61							
18	14	68							
19	16	76							
20	18	84							

Defensive Skill Level 9 - 11

AL	Parry Class 9	8	7	6	5	4	3	2	1
-9	0	3	6	9	13	16	22	29	32
-8	0	3	7	10	15	18	25	32	36
-7	0	4	8	12	16	20	28	36	40
-6	0	4	9	13	18	22	31	40	45
-5	0	5	10	15	20	25	35	44	49
-4	0	5	11	16	22	28	39	49	55
-3	0	6	12	18	25	31	43	55	61
-2	0	7	14	21	27	34	48	61	68
-1	0	8	15	23	30	38	53	68	76
0	1	9	17	26	34	42	59	76	84
1	1	10	19	28	38	47	66	84	93
2	1	11	21	32	42	52	73	93	
3	1	13	24	35	47	58	81		
4	1	14	27	39	52	65	90		
5	2	16	30	44	58	72			
6	2	17	33	49	64	80			
7	2	20	37	54	71	89			
8	3	22	41	60	79				
9	3	24	46	67	88				
10	3	27	51	74	98				
11	4	30	56	83					
12	4	34	63	92					
13	5	37	70						
14	6	42	78						
15	6	46	86						
16	7	51	96				HIT		
17	8	57							
18	9	64							
19	10	71							
20	11	79							

Defensive Skill Level 12 - 14

AL	Parry Class 9	8	7	6	5	4	3	2	1
-9		3	6	9	12	16	22	29	32
-8		3	6	10	13	18	25	32	36
-7		3	7	11	16	20	28	36	40
-6		4	8	12	18	22	31	40	45
-5		4	9	14	19	24	34	44	49
-4		5	10	16	21	27	38	49	55
-3		6	12	18	24	30	43	55	61
-2		6	13	20	27	34	47	61	68
-1		7	15	22	30	38	53	68	76
0	0	8	16	25	33	42	59	76	84
1	0	9	18	28	37	46	65	84	93
2	0	10	20	31	41	52	72	93	
3	0	11	23	34	46	57	81		
4	0	13	25	38	51	64	90		
5	0	14	28	43	57	71			
6	0	16	32	47	63	79			
7	0	18	35	53	70	88			
8	0	20	39	59	78	98			
9	0	22	44	65	87				
10	0	24	48	72	96				
11	1	27	54	80					
12	1	30	60	89					
13	1	34	67						
14	1	38	74						
15	1	42	82						
16	2	47	91				HIT		
17	2	52							
18	2	58							
19	3	64							
20	3	71							

Defensive Skill Level 15 +

AL	Parry Class 9	8	7	6	5	4	3	2	1
-9		2	6	9	12	16	22	29	32
-8		2	6	10	13	17	25	32	36
-7		3	7	11	15	19	28	36	40
-6		3	8	12	17	21	31	40	45
-5		4	9	14	19	24	34	44	49
-4		4	10	16	21	27	38	49	55
-3		5	11	18	24	30	43	55	61
-2		6	13	20	27	34	47	61	68
-1		7	14	22	30	37	53	68	76
0		8	16	25	33	42	59	76	84
1		9	18	27	37	46	65	84	93
2		10	20	30	41	51	72	93	
3		11	22	34	46	57	80		
4		12	25	38	51	64	89		
5		13	28	42	56	71			
6		15	31	47	63	79			
7		17	34	52	70	87			
8		19	38	58	77	97			
9		21	43	64	86				
10		23	47	72	96				
11		26	53	80					
12		29	59	88					
13		32	65	98					
14		36	73						
15		40	81						
16		45	90				HIT		
17	0	50							
18	0	55							
19	0	61							
20	0	68							

CUTTING HIT LOCATION AND DAMAGE TABLE / 5A

Hit Location Left	Hit Location Right	Armor Class	Impact Damage (ID)
		PL	11 21 33 37 41 45 49 53 57 61 65 69 73 77 81 85 89 93 97 01 09 17 25 33 41 57
		BR	5 9 13 16 20 25 30 35 41 44 47 50 53 56 59 62 65 68 71 74 80 86 92 98 04 16
		ML	4 7 10 13 17 19 20 23 25 27 29 31 33 35 37 39 41 43 45 47 51 55 59 63 67 75
		LT	3 4 5 7 11 13 15 17 19 21 23 24 26 28 30 31 33 35 37 38 42 45 49 52 56 63
		NO	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 22 24 26 28 30 34
00 - 31		Head	1 1 29 90 4H 8H 2K 3K 5K 7K 9K 1T 1T 2T 2T 2T 3T 3T 4T 4T 5T 7T 9T 1X 1X 2X
32 - 32		Neck	3 1K 1K 1K 1K 2K 2K 2K 2K 2K 2K 2K 2K 2K 2K 2K 3K 3K 6K 1T 1T 2T 2T 2T 3T 3T
33 - 44	45 - 49	Shoulder	1 1 4 7 13 17 23 28 34 52 76 1H 1H 1H 2H 2H 2H 3H 3H 4H 5H 6H 3K 4K 4K 5K
50 - 50		Upper Chest	3 3 3 5 20 40 65 1H 2H 3H 4H 6H 9H 1K 1K 2K 2K 2K 3K 3K 4K 5K 6K 7K 2T 5T
51 - 52		Lower Chest	3 3 3 5 18 25 36 52 80 1H 2H 4H 8H 9H 1T 1T 1T 2T 2T 3T 4T 4T 5T 7T 9T 1X
53 - 54		Abdomen	2 8 25 52 71 1H 2H 3H 4H 5H 6H 7H 1K 1K 1K 2K 2K 2K 2K 2K 2K 3K 3K 3K 4K 9K
55 - 59		Hip	1 2 3 5 15 22 29 43 54 66 89 1H 1H 2H 3H 3H 4H 5H 5H 6H 9H 1K 1K 2K 2K 2K
60 - 63	64 - 69	Upper Arm	3 4 6 11 16 19 23 40 57 77 1H 1K 2K 2K 2K 2K 2K 2K
70 - 72	73 - 76	Forearm	3 8 13 15 19 28 42 69 91 4H 8H 9H 1K 1K 1K 1K
77 - 79	80 - 82	Hand	1 3 6 15 26 42 64 93 1H 2H 2H
83 - 88	89 - 94	Thigh	2 6 13 35 52 72 98 1H 2H 2H 2H 3H 3H 3H 3H 3H 4H 4H 5H 5H 5H 6H 6H 7H 8H 3K
95 - 98	99 - 99	Shin	2 4 6 10 22 31 55 69 86 1H 2H 3H 4H 5H 5H 5H 5H 6H 6H 6H 7H 7H 8H 2K 2K 2K

STABBING HIT LOCATION AND DAMAGE TABLE / 5B

Hit Location Left	Hit Location Right	Armor Class	Impact Damage (ID)
		PL	6 7 9 12 13 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35
		BR	4 5 7 9 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
		ML	3 4 5 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29
		LT	2 3 4 5 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28
		NO	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26
00 - 05		Forehead	80 2H 4H 1K 2K 4K 6K 8K 1T 2T 2T 2T 3T 3T 3T 4T 4T
06 - 07		Eye	61 2H 4H 1K 2K 4K 6K 8K 1T 1T 2T 2T 2T 3T 3T
08 - 14		Mouth	2 4 20 31 41 51 2H 1K 4K 5K 5K 5K 5K 5K 6K 6K 6K 7K 7K 7K 7K
15 - 17		Neck	25 67 1H 2H 1K 3K 4K 4K 4K 5K 5K 6K 6K 6K 6K 6K 7K 7K 7K 8K 8K
18 - 19		Base of Neck	3 13 21 32 38 50 1H 6H 4K 4K 5K 6K 6K 6K 6K 6K 6K 6K 7K 7K 7K 7K 8K
20 - 20	21 - 21	Shoulder Socket	1 1 2 3 4 5 6 9 11 13 15 17 20 23 26 29 32 35 38 41 44 48 51 54 65 82
22 - 23	24 - 25	Shoulder Scapula	5 11 22 38 50 72 87 1H 1H 1H
26 - 30		Lung	1 1 5 28 4H 5H 5H 9H 1K 1K
31 - 32		Heart	3K 5K 8K 1T 1T 1T 2T 2T 3T 3T 4T 4T 4T 4T 5T 5T 5T 5T 6T 6T 7T 7T 7T 7T
33 - 34		Liver	1 1 9 72 2H 4H 7H 9H 9H 1K 2K 2K 2K 2K
35 - 35		Stomach	1 1 6 27 52 1H 2H 2H 2H 3H 4H 5H 6H 6H
36 - 38		Stomach-Kidney	1 1 6 33 86 3H 5H 7H 8H 1K 2K 3K 3K 3K
39 - 40		Liver - Spine	14 65 1H 1H 2H 6H 2K 4K 5K 7K 7K 7K 7K 7K 7K 7K 7K 9K 9K 1T 1T 1T 1T 1T
41 - 42		Liver - Kidney	1 1 9 72 2H 5H 9H 1K 1K 2K 2K 3K 4K 4K
43 - 46		Intestines	12 33 75 1H 2H 3H 4H 5H 5H
47 - 47		Spine	12 33 40 48 55 66 2K 3K 5K 5K 5K 5K 5K 5K 6K 6K 6K 6K 7K 7K 7K 7K 7K
48 - 54		Intestines-Pelvis	10 33 81 1H 2H 2H 3H 3H 4H 4H 5H 5H
55 - 58		Hip Socket	1 1 2 3 4 6 7 8 9 11 14 17 20 23 26 29 32 36 40 44 48 52 56 60 63 86
59 - 62	63 - 66	Upper Arm	2 3 4 5 7 12 24 41 61 85 1H
67 - 70	71 - 74	Forearm	1 2 2 8 16 31 49 70 92
75 - 75	76 - 76	Hand	2 5 12 17
77 - 83	84 - 90	Thigh	5 6 8 12 15 18 21 24 28 32 36 40 44 48 52 69 98 1H 2H 2H 2H 3H 3H
91 - 92	93 - 95	Shin	1 1 1 2 2 3 5 6 7 7 8 11 13 17 21 25 29 33 37 41 45 50 55 60 65 92
96 - 97	98 - 99	Foot	1 3 5 8 14 18 25 36 45

* Maximum Penetration Depth with a Beaked Axe.

FLANGE HIT LOCATION AND DAMAGE TABLE / 5C

Hit Location Left	Hit Location Right	Armor BPF	Impact Damage (ID)																											
		3+	6	9	12	17	23	27	34	37	40	43	47	50	54	56	59	63	67	71	76	78	81	86	88	91	97	01		
		3	4	7	9	13	17	20	24	28	30	32	35	38	41	42	44	47	51	54	57	59	61	65	67	69	73	76		
		2	3	5	6	9	11	13	15	18	20	21	23	25	27	28	29	32	34	36	38	39	41	43	44	46	49	51		
		1	2	4	5	7	8	10	11	13	14	16	17	18	20	21	22	24	26	27	29	30	31	33	34	35	37	38		
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26		
00 - 31		Head	1	32	98	2H	4H	7H	1K	1K	2K	3K	3K	4K	5K	6K	8K	9K												
32 - 32		Neck	2	6	12	18	26	38	47	70	84	90	1H	1H	1H	1H	2H	2H	2H	2H	3H	3H	3H	3H	4H	4H	5H	6H		
33 - 44	45 - 49	Shoulder	1	2	3	4	9	11	17	22	27	40	55	72	86	1H	1H	1H	2H	2H	2H	2H	3H	3H	4H	4H	4H	5H		
50 - 50		Upper Chest	1	2	3	7	13	20	30	45	56	69	90	1H	1H	2H	2H	3H	4H	5H	5H	5H	7H	8H	9H	9H	1K			
51 - 52		Lower Chest	1	2	3	7	13	20	30	45	54	64	82	1H	1H	1H	2H	2H	2H	3H	3H	3H	4H	5H	5H	6H	7H			
53 - 54		Abdomen	2	6	12	18	27	42	51	81	99	1H	2H	2H	2H	3H	3H	4H	4H	5H	6H	6H								
55 - 59		Hip	2	6	9	14	17	20	23	27	41	57	81	99	1H	1H	2H	2H	3H	3H	4H	4H	5H	5H	6H	7H				
60 - 63	64 - 69	Upper Arm	2	4	7	12	15	21	25	29	37	46	55	76	97	1H														
70 - 72	73 - 76	Forearm	2	6	9	15	18	29	36	46	52	60																		
77 - 79	80 - 82	Hand	1	2	5	8	13	15																						
83 - 88	89 - 94	Thigh	2	6	12	18	28	34	51	61	83	1H	1H	1H	2H	2H	2H	3H	3H	3H	4H	4H	4H							
95 - 98	99 - 99	Shin	1	3	5	7	13	20	32	38	55	67	80	1H	1H	1H	2H													

BLUNT HIT LOCATION AND DAMAGE TABLE / 5D

Hit Location Left	Hit Location Right	Armor BPF	Impact Damage (ID)																											
		3+	11	22	24	31	40	44	53	62	66	73	77	84	90	99	06	10	17	21	32	43	50	54	61	65	76	98		
		3	5	10	11	14	18	20	24	28	30	33	35	38	41	45	48	50	53	55	60	65	68	70	73	75	80	90		
		2	4	7	8	11	15	17	20	24	26	28	30	32	34	39	41	43	46	48	52	56	59	61	64	66	70	78		
		1	3	3	4	5	9	11	13	14	15	16	17	18	19	20	22	24	26	27	28	30	32	34	36	38	40	42		
		0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26		
00 - 05		Head	1	2	4	34	2H	4H	7H	1K	2K	2K	3K	4K	5K	6K	7K	8K	9K	1T	1T	2T	2T	2T	2T	3T	3T	3T		
06 - 07		Face	2	4	8	70	1H	3H	5H	8H	1K	2K	3K	4K	5K	6K	7K	8K	9K	1T	1T	2T	2T	2T	2T	3T	3T	3T		
08 - 14		Jaw - Mouth	2	4	8	63	95	1H	2H	3H	5H	7H	9H	1K	2K	2K	3K	4K	5K	6K	7K	8K	9K	1T	1T	2T	2T	2T		
15 - 15		Neck	3	12	45	1H	2H	3H	4H	4H	4H	4H	4H	5H	5H	5H	5H	5H	6H	6H	6H	6H	6H	7H	7H	8H	8H	1K		
16 - 17		Base of Neck	1	2	3	8	14	39	78	1H	2H	3H	4H	4H	4H	4H	4H	5H	5H	5H	5H	5H	6H	6H	6H	6H	6H	7H		
18 - 19	20 - 21	Shoulder	1	2	3	4	5	6	7	9	12	15	18	22	25	28	31	34	37	41	44	47	51	54	54	64	64	69		
22 - 30		Upper Chest	1	2	3	6	11	18	27	37	49	61	76	1H	1H	2H	2H	3H	3H	4H	4H	5H	6H	7H	7H	1K	1K	1K		
31 - 32		Heart	1	2	3	10	28	76	1H	3H	9H	1K	1K	2K	2K	3K	4K	5K	6K	8K	1T	1T	1T	2T	2T	3T	3T	3T		
33 - 42		Lower Chest	1	2	3	6	11	18	27	37	50	63	80	1H	1H	2H	2H	3H	3H	4H	4H	5H	6H	7H	7H	2K	2K	2K		
43 - 50		Abdomen	1	3	5	11	20	28	36	43	52	60	68	75	83	90	98	1H	1H	1H	1H	1H	1H	2H	2H	2H	2H	2H		
51 - 54		Groin	3	10	18	35	39	45	53	60	68	75	84	95	1H	1H	1H	1H	1H	1H	2H	2H	2H	2H	2H	2H	2H	2H		
55 - 58		Hip	1	2	3	4	5	6	8	12	16	20	23	27	31	35	39	43	47	52	56	60	65	69	69	84	84	92		
59 - 62	63 - 66	Upper Arm	1	1	2	4	8	15	19	23	31	43	56	72	1H	1H	1H													
67 - 70	71 - 74	Forearm	1	2	3	5	9	18	22	28	37	50	60																	
75 - 75	76 - 76	Hand	1	2	3	5	10	13	15																					
77 - 83	84 - 90	Thigh	1	1	2	4	8	15	19	23	31	43	56	72	1H	1H	1H	2H	2H	2H	2H	3H	3H	3H	3H	4H	4H	5H		
91 - 92	93 - 95	Shin	1	1	2	2	3	4	6	9	12	15	19	24	35	80	1H	1H	1H	1H	1H	1H	1H	1H	2H	2H	2H	2H		

GLANCING TABLE / 5E

Weapon	Armor	Glancing Roll (0 - 9) 0	1	2	3	4	5	6	7	8	9
Edged, Flanged, Blunt	Plate	.25	.5	.75	.75	1					
	Brigandine/Scale	.5	.5	.75	1						
	Mail	.5	.75	.75					FULL		
	Leather	.5	.75	1							
	No Armor	.75	1								
Stabbing Point	Plate	0	0	.25	.5	.5	.5	.75	.75	1	
	Brigandine/Scale	0	0	.5	.5	.5	.75	.75	1		
	Mail	0	.25	.5	.5	.75	.75	1			
	Leather	0	.5	.5	.75	.75	1		FULL		
	No Armor	.5	.75	1	1	1					

MEDICAL AID AND RECOVERY TABLE / 6A

Damage Total	Healing Time	No Aid		First Aid		Aid Station		Field Hospital		Trauma Center						
										Recovery Roll						
										Trauma Center Tech Level						
DT	HT	CTP	RR	CTP	RR	CTP	RR	CTP	RR	CTP	13	14	15	16	17	18
5	17	79h	94	25d	96											
10	25	75h	89	25d	92											
15	30	72h	85	25d	89											
20	35	68h	81	25d	86	25d	96									
25	38	65h	77	25d	82	25d	95			RR = 99						
30	41	62h	73	25d	79	25d	94									
35	43	59h	69	25d	76	25d	93	25d	97							
40	44	56h	66	25d	73	25d	92	25d	96							
45	46	53h	63	25d	70	25d	91	25d	96							
50	47	51h	60	25d	68	25d	90	25d	95							
60	48	46h	54	25d	63	25d	89	25d	94							
70	50	41h	49	25d	58	25d	87	25d	94							
80	51	37h	44	25d	54	25d	85	25d	92	25d	97					
90	52	34h	40	25d	50	25d	83	25d	91	25d	96					
100	53	31h	36	25d	46	25d	82	25d	90	25d	96	97				
200	61	11h	12	23d	21	25d	67	25d	82	25d	92	94	96			
300	65	4h	04	19d	10	25d	55	25d	74	25d	89	91	94	96		
400	68	93m	01	16d	04	25d	45	25d	67	25d	85	88	92	95	97	
500	70	35m	00	13d	02	25d	37	25d	61	25d	82	85	90	94	96	
600	72	13m	00	10d	01	25d	30	25d	55	25d	79	82	88	93	95	
700	73	6m	00	8d	00	25d	25	25d	50	25d	76	80	86	92	94	
800	75	5m	00	7d	00	25d	20	25d	45	25d	73	77	84	91	94	97
900	76	4m		6d	00	25d	16	25d	41	25d	70	75	82	90	93	96
1000	77	90p		5d		25d	13	25d	37	25d	67	73	80	89	92	96
2000	84	85p		15h		6d	02	25d	13	25d	45	53	64	79	85	92
3000	88	81p		2h		21h	00	5d	05	18d	30	38	52	70	79	89
4000	91	76p		22m		4h	00	18h	02	72h	20	28	41	62	73	85
5000	93	71p		6m		63m	00	5h	01	21h	13	20	33	55	67	82
6000	95	67p		4m		36m	00	3h	00	12h	09	15	27	49	62	79
7000	96	62p		87p		29m		2h	00	10h	06	11	21	43	57	76
8000	98	57p		75p		25m		2h	00	8h	04	08	17	39	53	73
9000	99	52p		67p		22m		2h		7h	03	06	14	34	49	70
12000	102	38p		57p		19m		95m		6h	01	03	07	21	39	62
16000	105	25p		44p		15m		75m		5h	00	01	03	13	28	53
20000	107	1p		30p		10m		50m		3h		00	01	09	20	45
40000	114	1p		15p		5m		25m		2h			00	01	04	20
60000	118	1p		10p		3m		17m		68m				00	01	09
80000	121	1p		8p		75p		13m		52m					00	04
100000	123	1p		6p		60p		10m		40m						02

INCAPACITATION TIME TABLE / 6B

PD Total	Random Roll 0	1-2	3-5	6-7	8	9
0	1p	1p	2p	4p	6p	11p
50	4p	15p	29p	47p	73p	4m
100	25p	3m	5m	9m	14m	25m
200	3m	11m	21m	23m	53m	96m
300	10m	33m	63m	2h	3h	5h
450	25m	85m	3h	4h	7h	12h
600	50m	3h	5h	9h	14h	25h
750	2h	6h	11h	19h	29h	53h
1000	5h	17h	32h	53h	82h	6d

KEY

CTP = Critical Time Period; the maximum length of time between the time of the injury and the Recovery Roll (RR).
DT = Damage Total. Total Physical Damage (PD) taken times 10, divided by the character's Health Characteristic (HLT).
HT = Healing Time in days.
RR = Recovery Roll; percent chance of surviving.
d = Days
h = Hours
m = Minutes
p = Phases (2 seconds)

Date	Tech Level
1831-1889	1st Aid
1890-1918	Aid Stn
1919-1945	Fld Hsp
1946-2000	13
2001-2030	14
2031-2060	15
2061-2120	16
2121-2250	17
2251-2345	18

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PHOENIX COMMAND™

High-Tech Weapon Data Supplement

LEADING EDGE GAMES

Previously published as the **High-Tech Weapon Data Supplement** for the Living Steel™ Role-Playing Game

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ARMOR DATA TABLES

WEAPON DATA TABLES

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This **High-Tech Weapon Data Supplement** has been designed for use with other Leading Edge Games products, especially the **Living Steel**™ role-playing system and the **Phoenix Command**™ combat system. All the weapon and armor data required for futuristic warfare with those systems has been included.

The first chapter gives weapon descriptions, and includes a brief overview of the background and history of the **Seven Swords** story line. (Further details about this story are available in Living Steel and other Seven Swords games.) The second chapter defines the abilities and uses of various armors, while the third chapter gives the data needed for the weapons.

There are three types of weapons found in Chapter 3: **Point Fire Weapons,** such as lasers and automatic rifles; **Explosive Direct Fire Weapons,** such as rocket launchers; and **Grenades & Explosives.** A separate section defines the terms which are used with each type of weapon. Following Chapter Three are the Armor and Weapons charts, which contain the specific data for all weapons and armor, and separate them all by type and nationality.

Several references are made to rules contained in Living Steel. These should simply be ignored by players who do not have Living Steel.

1.1

OVERVIEW

This chapter describes the weapons used in the **Third Seven Worlds—Starguild War,** which was interrupted by the **Spectral**™ invasion of known space. This time period corresponds to Tech Level 18 of the Seven Swords time line, Standard Date 2251 to 2345.

The primary combatants in the Seven Worlds—Starguild wars have been Seven Worlds forces, the alien **Dragoncrests**™, and the armies of the **Starguild Imperium.**

The long conflict between the Seven Worlds and the Imperium has its roots in the late 21st century, as Humanity first set out into the stars. At that time, the **Starguild** was formed, as a pact among the powerful to maintain their security, and as a means of controlling most of Humanity. The Starguild divided people into three hereditary classes: the **Starcaste,** owners of all advanced techonology and the absolute rulers of society; the **Landcaste,** feudal overlords of individual planets; and the **Bondsmen,** workers who were trapped in lives of endless labor and little hope.

Many people were dissatisfied with the Starguild Imperium, and by 2140 the free Seven Worlds system, which contained seven habitable worlds in orbit around a single sun, was a rallying point for those who believed in freedom and justice, and who wanted the chance to control their own lives. Countless battles were fought on dozens of worlds, as the Imperium sought to destroy the Seven Worlds. In 2170, the Dragoncrests entered the scene. Rulers of a vast empire of their own, they considered the Seven Worlds system to be an irresistible prize, and joined in the battle, making war with both the Seven Worlds and the Starguild.

Assailed by two powerful enemies, the Seven Worlds system was at last overwhelmed in 2194, and the Imperial flag was raised in the system. War between the Dragoncrests and the Imperium continued, however, and the Starguild was unable to consolidate its gains. By 2220 the Dragoncrests were winning the war, and the sons and daughters of the Seven Worlds were able to rise up again, and resist the Imperium. Generations of warfare followed, still centered on the Seven Worlds system, until the closing years of the 23rd century, when the Dragoncrests suddenly withdrew to face an unknown threat from the other side of their empire. What remained of the battered Seven Worlds society fought a final engagement with the Imperium, and then vanished from known space with their entire space fleet. The victorious Starguild entered a Golden Age.

A generation later, in 2337, both the Dragoncrests and the people of the Seven Worlds returned to the Seven Worlds system as a united force, and the Third Seven Worlds—Starguild War was begun. This war was soon interrupted by the alien race which had distracted and devastated the Dragoncrests: the Spectrals. They invaded human space in force, their attack clearly aimed at genocide. All available Starguild forces rallied to face this new opponent, and contact with the Seven Worlds ended.

The Spectral invasion has been Humanity's greatest test. The mighty Starguild Imperium is collapsing under the onslaught and desperate struggles have broken out on dozens of worlds.

The weapons used in these conflicts have been divided into a number of categories and are described in the following sections.

1.2

LANDCASTE WEAPONS

The **Landcaste** do not possess stardrive or any of the related technologies. As a result, they serve as planetary monitors, governing the planets and colonies of the Starguild, and are subservient to their masters, the Starcaste. In return for their loyal service, and as long as productivity remains high, the Landcaste is rewarded with a heightened standard of living.

Landcaste weapons are similar to 20th century conventional arms. They fire high efficiency caseless munitions, using technology which has not progressed since 2010. The Landcaste have been held in check by their hereditary masters, the Starcaste, who carefully monitor Landcaste weapon technology.

A few elite Landcaste infantry, however, are armed with Starforce weapons. The number of these elites is carefully controlled by the Starcaste, and their equipment must be purchased and serviced by Starcaste representatives. Although the technology of these weapons could be within the capability of the Landcaste, the ban on their manufacture is never challenged. The Landcaste are not eager to irritate the Starcaste.

Flechette and Sliverguns

Flechette and sliverguns fire small metal darts. These darts are enclosed in a casing called a 'sabot' which protects the dart from damage during firing. After leaving the barrel, the sabot falls away, leaving only the dart to continue on. Dart diameters are given in the **Weapon Data Tables.** These long darts have a high sectional density, which gives greater penetration for the same bullet mass and velocity. Their effective range, however, is limited.

The limited range of flechette and sliverguns is due to their ammunition's inherent inaccuracy. Manufacturing tolerances and sabot ejection tipoff contribute to this inaccuracy. Data from the shaded portion of the Weapons Charts is for fire beyond effective range, and should only be used in conjunction with the **Ballistic Accuracy** rules of the **Advanced Phoenix Command Combat Supplement.**

Flechette guns fire unstabilized darts. They use their aerodynamic form for flight stabilization in an atmosphere.

Sliverguns fire fin-stabilized darts. Fin stabilization gives them a truer flight and longer effective range.

Ammunition is held head-to-tail in four tubes housed in a magazine which fits along the length of the weapon. A self-contained pressure unit within each magazine pressure feeds the ammunition to the firing mechanism near the butt end. This allows a high ammunition capacity without external protrusions. The magazines are completely sealed before use. Upon loading, the seal is broken, and the unit pressurized. This minimizes contamination and dirt entry into the weapon.

The weapon's firing mechanism has two twin chambers which function like a revolver. As each chamber passes its load tube, it is fed a round from the magazine. As it passes the barrel, it may be fired.

Assault Rifles

Assault rifles and machine guns are similar to the sliverguns of the preceding section, but fire conventional spin stabilized ammunition. This, while inexpensive, lacks the penetrating power of the flechette or slivergun. Spun ammunition, on the other hand, is very stable and accurate. It does not require the manufacturing precision of fin-stabilized darts, and except for greater recoil and weight, is comparable to sliverguns in performance. For this reason, the assault rifle is the standard Landcaste military weapon. The weapon's magazine and firing mechanism are similar to those of flechette and sliverguns.

The following are a number of Landcaste weapons.

AP5-8: 6mm Automatic Pistol

Light automatic pistol adopted by Landcaste law enforcement agents and Starfleet personnel. Popular for its light weight, high ammunition capacity, and light recoil, it is by far the most widely used sidearm.

This caseless munition weapon is similar to 20th century automatic pistols. Ammunition is fed from the weapon's magazine in a manner typical of 20th century pistols. The powder charge is contained in a cavity in the rear of the projectile. As there is no case to eject, moving parts are completely internal to the weapon. In case of a misfire, or to remove a chambered round, the top slide is pulled back and the round ejected. The external top slide only moves when manually feeding or ejecting a round.

"Talk is cheap, but guns cost money."
Stuart Tank

AP6-8: 7mm Automatic Pistol

7mm version of the AP5-8 designed to provide greater stopping power. It is a common sidearm of the Landcaste military.

AP7-8: 7mm Automatic Pistol

This is a long barreled version of the AP6-8 and was introduced as the standard sidearm of Starmarine and Landcaste forces during the First Seven Worlds—Starguild war. Today it is widely used by professional forces and is highly respected for its accuracy and hitting power.

FMP8: 1.5mm Flechette Machine Pistol

Compact machine pistol designed for clandestine operations. Its small size, light weight, and firepower make it a popular undercover weapon. Its short effective range limits its use as a military weapon, but its excellent short range characteristics make it popular with Starcaste and Landcaste bodyguards.

FMPX8: 2.8mm Flechette Machine Pistol

Compact machine pistol designed to defeat Power Armor at close range. This capability makes it popular with infiltration and high level security teams.

The FMPX8 offers a great deal of firepower in a small package. It is, however, rather heavy and has a limited effective range.

SMP8: 1.7mm Slivergun Sub-Machinegun

Standard Landcaste law enforcement weapon. It is a high velocity, caseless slivergun firing 1.7mm fin stabilized darts.

SMPGL8: 1.7mm Slivergun—Grenade Launcher

This popular Landcaste squad support weapon is a combination 1.7mm slivergun and 30mm grenade launcher. The five round semi-automatic grenade launcher is the primary system, with the slivergun serving as a backup weapon. The slivergun uses standard SMP8 magazines.

SAR8: 2.1mm Slivergun Assault Rifle

Short range assault rifle used by Landcaste and Subcon infantry. Designed for use in built up areas, its lack of stand-off range is compensated by superior fire power at short range.

AR8L: 4.8mm Assault Rifle

Light assault rifle issued to Landcaste garrison troops and law enforcement tactical teams.

AR8: 6mm Assault Rifle

Standard weapon of the Landcaste military. Known for its hitting power and extended range.

SAW8: 6.9mm Squad Automatic Weapon

Standard light machine gun of the Landcaste military. It is issued as a squad support weapon.

MG8L: 6.9mm Machine Gun

Standard Landcaste machine gun. Handled by a two man team, it is the pivot of Landcaste fire team tactics. One man carries the weapon (29.4 lb), while the other handles the ammunition (usually 4 magazines in a shoulder-slung pack, weighing 28.8 lb).

The weapon's magazine is mounted forward of the firing mechanism. This location was chosen for ease of reloading and mass balance. The weapon has an internal ammunition transport system feeding rounds from the magazine to the firing mechanism. This feed system holds 24 rounds, so the weapon's maximum capacity is 24 rounds greater than the magazine capacity. When a magazine is loaded into an empty weapon, 24 rounds are drawn into this feed system. When the magazine is empty a warning light goes on. The weapon still has 24 rounds remaining in the feed system, but the magazine has been emptied and may be replaced. This minimizes downtime during sustained fire.

***MG8H: 10.6mm Machine Gun**

Standard Landcaste heavy machine gun. It is usually mounted on vehicles, but can be tripod mounted and serviced by a four man team in the field. One man carries the weapon without the barrel (54.3 lb), a second the barrel and tripod (64.4 lb), and the other two, 4 magazines each (66 lb each). The weapon is designed to hold 4 magazines at once for sustained fire; each additional magazine is mounted in front of the preceding one. When a magazine is empty, it automatically kicks clear and the next is pressure fed into place. To allow for this function, an **Advanced Aiming System** is mounted at the front of the weapon. (For its effects, see Section 1.3.)

1.3

STARFORCE WEAPONS

The **Starcaste** is the ruling class, made up of the hereditary members of the various consortiums and corporations which comprise the Starguild. Their technological monopoly gives them tremendous wealth, and allows them to dominate the rest of Humanity. Each Guild member has its own Starforce, with which it enforces its will.

Starforce weapons have been designed for use by troops in any environment. This ranges from zero "g" and vacuum conditions to those of a heavy corrosive atmosphere. As shipping and supply are major factors, most weapons are Lase models. Using rechargeable power packs, lase weapons save valuable shipping costs associated with expendable munitions. They also do not depend on an atmosphere for projectile stabilization as a flechette or slivergun does, and are not dependent on caseless munitions. (Caseless munitions are dangerous in many environments, because some atmospheres spontaneously ignite the propellants on contact. This means any leak into the weapon magazine could be disastrous.)

To fill the role of area weapons, a number of rocket and grenade launchers have been developed. These weapons are available in limited numbers and significantly increase the firepower of **Starmarine** forces.

All Starforce weapons have **Advanced Aiming Systems (AAS).** The AAS is an optical and millimeter wave radar sighting system which provides multi-wave light amplifying and radar imaging. Radar ranging and indirect fire elevation and targeting are also provided. Weapons with AAS are marked with an asterisk (*). The effects of the AAS have already been included in all weapon data.

Gauss Guns

Gauss guns use a magnetic field to accelerate metal darts. These darts are similar to those used by sliverguns, but have no sabot. Gauss guns provide superb penetrating capability and better accuracy than sliverguns since they are not penalized by sabot ejection tipoff. Their disadvantages are a heavy power electronic package and high cost.

"Blam. Blam. Blam. Click. Click. "Stop Police."

Officer Cord Roberts
AKA "Rip-Cord"

For many years, weight and cost limited the gauss machine gun's acceptance by Starforces. With the advent of **Power Armor** and its high cargo capability, however, the Gauss gun found acceptance and is today the standard Starforce infantry support weapon.

Lase Weapons

Lase weapons are powered by a rechargeable power pack stored in the pistol grip. To reload, simply exchange a fresh power pack for the spent unit. All Starforce small arms lase weapons use the same .4 lb **power pack,** which greatly simplifies supply; only the number of shots possible per pack changes. **Lase Battlepacks** and **Gauss Machine Gun Battlepacks** use larger power packs and cannot use the smaller .4 lb packs. Likewise, Battlepack power packs cannot be used by the smaller weapons.

Man portable lase weapons have a limited range, due to losses in atmosphere and limitations in the ability to focus the beam. The large aperature, or muzzle, is a focusing unit. The larger the diameter of this unit, the greater the range at which the beam can be focused. For practicality, lase weapons have a 55mm aperature which gives them a range of 100 hexes (200 yards). Larger aperatures are heavy, expensive, and prone to damage.

Beyond the weapon's aperature range the beam can no longer be focused. It spreads and, as a result, penetration is reduced while the beam diameter increases. Some high power weapons are effective beyond their aperature range. For these weapons, the larger beam diameter results in a larger **Damage Class (DC)** beyond their aperature range.

Lase weapons have a number of power settings rather than ammunition types in the **Ballistic Data** section of the **Weapon Data Tables.** The first setting, marked (1), is for single shot fire. The other settings are for fully automatic fire and are the **Rates Of Fire (ROF)** in shots per burst. Note that the RID value for a lase weapon in fully automatic fire is less than the full power single shot setting.

A lase weapon's **Ammunition Capacity** gives the number of full power single shots which can be fired per power pack. **Each burst of fully automatic fire uses three (3) *single shot charges of power independent of the ROF.***

Battlepacks

Battlepacks are designed for Power Armor infantry and arm their users with a variety of lethal weapon systems. A battlepack serves as ammunition rack, reloading system, and power supply, and may be reloaded weapon by weapon, or replaced as a unit. As a battlepack uses the suit's target designating systems and assumes the user is protected from back blast and recoil, no battlepack can be used by anyone not in Power Armor.

Battlepack weapons have no trigger and there are few breaks in their smooth outlines. They are connected directly to the suit's targeting system through a pickup in the pistol grip. All weapon commands are relayed directly through this pickup to

mechanisms within the weapon. This means the user need never remove his hand from the pistol grip. Starmarines call this "keeping in touch".

The stock is usually a simple rod ending in a ball joint. This joint mates to a socket in the suit's shoulder, providing a firm, stable firing rest. The suit protects the user from the recoil pressure.

The bulky appearance of some of the weapons is due to armor. This protects the weapon from damage. The armor **Protection Factor (PF)** for backpack and weapon is given in the left column of the Weapon Data Tables.

"We would have believed it was an accidental shooting if he hadn't changed magazines . . . . . TWICE."

Judge Legg

The following are a number of Starcaste weapons. Model numbers preceded by an asterisk (*) are equipped with an Advanced Aiming System.

***GR8: 1.7mm Gauss Rifle**

The limited range of lase rifles led to the development of the Gauss Rifle. Gauss weapons use a magnetic field to fire a fin stabilized dart. Until recently, the weight of the magnetic assembly and power electronics has limited them to a machine gun role. Currently, a man-portable rifle is feasible.

This Gauss rifle is limited to semiautomatic fire as the weight of a fully automatic version exceeds Starforce weight limits. It provides Starmarines with a weapon with extended range capability, good penetration, and low ammunition weight. The power electronics and power pack are contained in a beltpack. The power pack (.4 lb) provides power for 175 rounds of fire (7 magazines) and is the same as the one used in lase rifles.

***GMG8L: 2.8mm Gauss Machine Gun**

Standard Starforce machine gun, usually supported by Power Armor. When used by non-powered infantry it is handled by a three man team. One man carries the weapon (31 lb), the second the power electronics (36 lb), and the third 10 magazines (34 lb). Each magazine contains an expendable power pack.

***BP-GMG8L: Battlepack Light Gauss Machine Gun**

Standard Starforce GMG8L machine gun mounted in a Battlepack. The backpack carries 5 extra magazines and its power packs will sustain 6 magazines of fire. To fire more than 6 magazines, two fresh power packs (3.3 lb each) must be installed.

***BP-GMG8H: Battlepack Heavy Gauss Machine Gun**

3.3mm Gauss Machine Gun mounted in a **Cargo Carrier Battlepack.** This is the Starforce's standard heavy machine gun. The weapon (53.7 lb) is carried in one hand, spare magazine rack (21.6 lb) in the other, and the power pack/electronics in the backpack (81.1 lb). The spare magazine rack holds 8 magazines. The power packs can sustain 9 magazines of fire. For further capability four fresh power packs (4.5 lb each) must be placed in the backpack.

***LMP8: Starfleet Lase Machine Pistol**

Standard Starfleet machine pistol designed for combat within the delicate confines of a starship. Its high Damage Class (DC) power settings will incapacitate unarmored targets without penetrating ship interior partitions or equipment panels, while its single shot fire is capable of defeating Power Armor. The LMP8 has an advanced adaptive focusing unit which allows it to vary beam size to match desired penetration. This means that, unlike other lase weapons, it is capable of varying its Damage Class (DC) and penetrating power, as well as its Rate Of Fire. Against Power Armor, the standard small focal beam, single shot setting is used. Against unarmored targets, a variety of Rates Of Fire and beam sizes (Damage Classes) are available.

***DRGN: Lase Machine Pistol**

This weapon is not a standard military or commercial weapon. It was produced illegally by **Trident's RMBK division** shortly before the Spectral invasion. These weapons were not exported and those found are part of an unknown quantity produced at the RMBK plant. Like the LMP8, it has an advanced adaptive focusing unit and can adjust beam size to fit need.

***LAR7: Lase Assault Rifle**

Standard Starmarine weapon during the Dragoncrest wars. More LAR7s were produced than the sum of all other models. Today, the LAR7 is still in service, but is no longer in production.

***LAR8: Lase Assault Rifle**

Standard Starforce lase weapon of the current period. It is an updated version of the renowned LAR7.

***LARGL8: Lase Rifle—Grenade Launcher**

Standard Starforce grenade launcher. It combines a 30mm grenade launcher with a standard LAR8 lase rifle. It is a common close support weapon particularly popular with Medium Combat Power Armored troops.

"... and grenades are also useful for digging foxholes, removing unwanted shrubbery, unclogging drains ..."

Art's Book of Explosives for Pyromaniacs

***LMG8L: Light Lase Machine Gun**

This light lase machine gun is a common Starforce squad support weapon.

***LMG8H: Heavy Lase Machine Gun**

Heavy lase machine gun providing excellent close support with extended range capability.

***GLB8A: 30mm Grenade Battery**

Tripod or turret mounted 30mm grenade launcher intended for vehicular use. It is an area saturation weapon commonly issued by the Starcaste to the Landcaste military for crowd suppression.

***RL8A: 70mm Rocket Launcher**

Shoulder fired low velocity rocket launcher effective against light fortifications and medium armored vehicles. It is breech loaded.

***RPG8A: 80mm Rocket Propelled Grenade**

Shoulder fired low velocity rocket propelled grenade launcher ideal for close combat support. It is a light, maneuverable, breech loading weapon.

***BP-GL8A: Battlepack 30mm Grenade Launcher**

High velocity Battlepack grenade launcher. It has a selectable auto-assisted reloading system which allows the user to selectively load ammunition of different types from the weapon's backpack magazine. To reload, the user swings the launch tube over his shoulder into the backpack loading system where it is automatically reloaded. The launcher is then removed for firing.

The BP-GL8A can fire standard 30mm grenades but usually uses its own high velocity ammunition. This high velocity ammunition will not feed in the SMPGL8, or LARGL8, as those weapons will not take the higher loads.

***BP-RR8C: Battlepack 45mm Rocket Rifle**

The Rocket Rifle is the product of a top priority program which began shortly after the start of the Dragoncrest wars. It is a copy of the **Dragoncrest X3LR1** shoulder fired high velocity rocket launcher. During the Dragoncrest wars it was available in three calibers; 20, 35, and 45mm. Of these, only the 45mm version remains in service. This is a Battlepack version of the weapon, designed to defeat Power Armor and armored vehicles at long to extreme range. Like the **BP-GL8A,** it has a selectable auto-assisted reloading system. To reload, the user swings the launch tube over his shoulder into the backpack loading system. A rocket is then automatically fed and armed after which the tube is removed for firing.

The Rocket Rifle was never popular with Starforces due to the expense of its ammunition. It saw limited service and was replaced by the Gauss Machine Gun.

***BP-RL8A: Battlepack 70mm Rocket Launcher**

Battlepack RL8A rocket launcher with shortened tube and selectable auto-assisted reloading system (see BP-RR8C).

***BP-RPG8A: Battlepack 80mm Rocket Propelled Grenade**

Battlepack RPG8A with selectable auto-assisted reloading system (see BP-RR8C).

1.4

SEVEN WORLDS WEAPONS

Seven Worlds forces of the Third Seven Worlds—Starguild war are a quickly assembled body of rebels and volunteers. Their weapons vary with unit and availability. Most rebel forces are armed with standard Starforce weapons, while volunteers carry whatever is available, typically Landcaste weapons.

Exceptions to this are a few units reported armed with **Seven Swords Power Armor.** This Power Armor is not produced within the Starguild, and up to this time has been thought extinct. It has not been seen since the fall of the Seven Worlds to Starguild forces decades ago. Currently, updated models are reported in action against Starguild forces. The primary weapon systems of Seven Swords Power Armor are **Seven Swords Battlepacks.** These Battlepacks are based on Dragoncrest models, and were developed during the **1st** and **2nd Seven Worlds—Dragoncrest Wars.**

The expense of maintaining and manufacturing Seven Swords style Battlepacks has kept the Starguild from putting them into production. Such systems are designed for a small and highly trained fighting force. The Starguild has always relied on numbers and area saturation weapons rather than the quality of individual infantry. They prefer the BP-GMG8L and BP-RPG8A, which can be produced at a far lower cost and are more useful against unarmored targets.

***7SL8: Seven Swords Battlepack Lase Cannon**

Sturdy, formidable lase cannon designed specifically to defeat Power Armor and armored vehicles. It can only be used with Seven Sword Power Armor and power packs. The backpack contains six 2.5 lb power packs.

***7SLR8: Seven Swords Lase/Rocket Twin Battlepack**

The 7SLR8 is a dual weapon system. It combines a high power lase cannon and 15mm rocket rifle into one deadly system. This allows the user to engage targets efficiently at both long and short range.

Data for the lase rifle is found in the Point Fire Weapon section. Data for the rocket rifle is found in the Explosive Direct Fire Weapon section. The lase rifle is powered by two 2.5 lb power packs contained in the backpack. Power is transferred through an armored umbilical from backpack to weapon. The backpack contains a selectable auto-assisted reloading system for the rocket rifle. This reloading system is described in the BP-RR8C weapon entry.

***7SLG8: Seven Swords Lase/Grenade Twin Battlepack**

The 7SLG8 is a dual weapon system combining a high power lase cannon and 30mm grenade launcher. It is designed for maximum firepower in close contact with Starguild forces.

Data for the lase rifle is found in the Point Fire Weapon section (7SLR8 entry). Data for the grenade launcher is found in the Explosive Direct Fire Weapon section. The lase rifle is powered by two 2.5 lb power packs contained in the backpack. Power is transferred through an armored umbilical from backpack to weapon. The backpack contains a selectable auto-assisted reloading system for the grenade launcher. This reloading system is described in the BP-RR8C weapon entry.

1.5

SPECTRAL WEAPONS

Not a great deal is known of the Spectral homeland or origin. What is known is that they are an entirely alien race which operates with a hive mentality. They do not exist as individuals and are separated into four distinct types: **Minor Workers, Major Workers, Minor Warriors,** and **Major Warriors.** Each class has a specific function within

their communities but the exact nature of their command, economy, and civilization remains unknown.

Spectrals control a number of subject races. To date, two such races have been identified, the **Trank** and **Slozek.** The Trank are used as technicians, the Slozek as light infantry. It is surmised that all Spectral weapons and equipment are manufactured by the Trank.

Spectral equipment is a direct copy of Starguild models. These copies are identical in all respect to Starguild originals and may be identified by the fact they all bear the same serial and lot number. Weapons which have been copied are the LAR8, LMG8L, LMG8H, GMG8L, LARGL8, RL8A, and RPG8A. Spectral Workers and auxiliary troops are bipedal with limbs well suited for using these weapons. Weapons are generally carried, used, and serviced without modification of the basic Starguild design.

Spectral Warriors, however, significantly modify their weapons. As they are designed purely for war, these bipeds assimilate their weapons into their own body structure. Exterior panels and handles are removed and muscle groups are grown for operating the weapon's internal mechanical features. This makes the weapon a permanent feature of a Spectral Warrior. It is reloaded and its parts serviced as any Starguild weapon, but it is now part of the Warrior with muscle groups specifically designed for its function. If the weapon is damaged, it is rejected and a replacement assimilated. This assimilation takes three hours.

While the majority of Spectral weapons are of Starguild design, new weapons of original design have been reported. One such is the **X7MP1.** This design cannot be traced to Dragoncrest or Starguild, but is built with manufacturing techniques unique to Dragoncrest technology. Speculation indicates a possible collusion between the Spectrals and the Dragoncrests. If confirmed, that alliance would tip the balance further in the Spectral's favor.

X7MP1: Spectral Machine Pistol

This weapon has been transported to many planets by Spectral invasion forces. It is a light, compact machine pistol firing 7.3mm explosive rounds. Tens of thousands of the weapons are dispersed by the Spectrals on target worlds during the chaos surrounding each invasion. This weapon cannot harm Spectral Warriors and has been designed specifically for humans to use on each other, especially in internal warfare among displaced civilians.

1.6

GRENADES AND EXPLOSIVES

Grenades are normally impact detonated, but also have a timer and ground sensing detonator.

The timer is a standard delay fuse with a binary clock, and can be set from one tenth of a second to 58.25 hours.

The ground sensing detonator will detonate upon detection of a 30 lb or larger object moving within one hex of its location. To place a ground sensing charge, the grenade is set to the ground mode for detection range of zero to one hex. The timer is then set and determines a safe time during which the ground sensor is inactive. After this time, the ground sensor is armed and will detonate upon detection of a 30 lb or larger object moving within its detection range.

Grenades attach directly to a **Combat Suit** or fighting harness and have a safety switch. In safe mode, they are inert. In arm mode, the grenade may be removed by pressing dual release clasps. Upon release it is fully armed. The Arm Time entry gives the time to release and arm the grenade. Once armed it may be thrown, its timer set, or its ground sensing system activated.

All grenades have a bonding agent at their base. When activated, they may be stuck on walls, ceilings, or vehicles, or similar surfaces.

The following is a brief description of common combat grenades and mines.

G-F8A: Starfleet Fragmentation Grenade

Small fragmentation grenade with limited explosive and fragmentation effects. This grenade is designed for use in commercial starcraft and can be used to knock out a vehicle's crew without destroying the vehicle.

G-F8B: Fragmentation Grenade

Small fragmentation grenade whose size and weight allow a number to be carried. This grenade is designed for clearing buildings.

G-B8B: Blast Grenade

Blast grenade similar to the **G-F8B** except it has no fragmentation sleeve and has an increased explosive charge. It is the same size as the G-F8B and has a protruding ridge on its case for easy identification.

G-F8C: Fragmentation Grenade

Standard fragmentation grenade of both Starforce and Landcaste military. Its fragmentation sleeve contains metal spheres of armor piercing materials for improved penetration.

G-B8C: Offensive Grenade

Nonfragmenting version of the **G-F8C.** It is the same size as the G-F8C and has a protruding ridge on its case for easy identification.

MGL-8A: Hydra—Multiple Grenade Launcher

The Hydra is a disposable unit which deploys to a 15 inch length for firing. It functions like a standard grenade launcher, but fires three grenades simultaneously. The detonation range of the first grenade is set during sight deployment. The second grenade explodes 1 hex further downrange, and the third 1 hex beyond the second. The minimum detonation range of the first grenade is 6 hexes. After an arming distance of 6 hexes the grenades may be impact detonated.

The Arm Time includes the time to deploy and set the detonation range. Weapon accuracy and aim time are handled as if the weapon were a grenade launcher. The Aim Time Mods are identical to those for an **AP5-8** pistol. The Weapon Data Table contains data for one of the three grenades. Damage from each is done separately.

M-CBU8B: Cluster Bomb Unit

Small Cluster Bomb Unit usually used as a mine. It has a ground sensing detonator (sensitivity range 0 to 5 hexes) and a radio detonator receiver. The mine may be buried up to four inches deep in loose ground. When activated, a small charge lifts it out of the ground and ejects 7 grenades. These grenades detonate on impact, one into each hex within a 1 hex range of the mine. The Weapon Data Table contains data for one of these grenades. Damage from each is done separately.

M-CBU8C: Cluster Bomb Unit

Larger version of the **M-CBU8B** which functions in the same manner.

M-F8B: Flechette Mine

This flechette mine has the same ground sensing and detonating system as the **M-CBU.** When activated, a small charge lifts it from the ground and detonates it. It is a single grenade which fires 300 armor piercing flechettes. These flechettes are effective against Power Armor and light vehicles.

2.1

NONPOWERED ARMOR

The Armor Data Table located on page 20 defines a number of body armors and gives their weights and armor **Protection Factors (PF).** The larger the PF, the greater the protection. The PF measures protection against penetration. If the weapon's RID is less than or equal to the PF, the armor stops the projectile. The BPF measures

armor stiffness and is used in the **Advanced Phoenix Command Combat Supplement,** as well as **Living Steel** and the **Phoenix Command Hand-to-Hand Combat System,** to determine the amount of **Blunt Trauma.**

The **Armor Data Table** separates armor Protection Factors (PF) into four areas; head, visor (Eye/Nose hit location), body, and limbs.

These unpowered armors are used by Landcaste and Starforce troops throughout known space. Body armor has become a standard piece of equipment in even the poorest military.

Flexible Armor

Flexible armor is made from flexible bullet resistant material. It is light, flexible, and comfortable to wear. Usually worn under normal clothing, flexible armor is worn by all off duty military personnel.

Combat Suit

A Combat Suit is a vacuum isolation suit made of flexible armor. It may include a life support system with air rebreather and thermal control. The life support system draws air, water, and power from a small beltpack. This beltpack provides a rated capacity of 24 hours. For extended use, extra beltpacks can be carried. A beltpack designed for operation in a lethal atmosphere weighs 7 pounds. Beltpacks for worlds in which breathing air can be filtered from the atmosphere weigh 2 pounds.

The Combat Suit not only protects the user from his environment, it provides autonomous puncture repair and medical aid. When the suit is punctured, it automatically attempts to seal the breach. The chance of its successfully accomplishing this depends on the Damage Class of the injury. The wounded man should roll a 1-10 random number each time he takes a penetrating hit. If the number rolled is less than the Damage Class of the injury received, the suit failed to seal. If he is in a hostile environment, this is a major problem. If he is still conscious he can attempt to patch the hole with a sealing unit located in the palm of each hand. Using this unit takes only 1 Action Count and all he need do is place the unit over the breach. Chemicals released by the suit in the breach location will automatically activate the sealing unit. The system does not work for punctures he cannot reach.

The medical aid system of the Combat Suit is simple and effective. Whenever the suit is punctured, and the user's body functions indicate he has been incapacitated, the suit automatically constricts about all wounds. This limits bleeding and doubles the injured's **Critical Time Period (CTP).** The suit then activates a homing beacon and continues to monitor body functions. When the user's body functions indicate impending death, the suit injects him with the drug **Oxyspan (Living Steel,** Section 3.4). This increases his Critical Time Period by two hours, or 100 times his CTP, whichever is less. Only one dose of Oxyspan can be taken, and at this point the suit has done all it can. If the user dies, it modifies its beacon signal letting would-be rescuers know there is no need to hurry.

It should be noted that Landcaste Combat Suits are not vacuum rated, and do not have any puncture repair system.

Armor Panels

Armor panels are rigid armor plates which fit over a Combat Suit. They greatly improve protection, at the expense of weight. They are worn by any force expecting to come under fire. The level of protection worn depends on the threat expected and strength of the user. The Starforce and Landcaste military require a soldier to have a Maximum Speed of at least 4HPP at full combat load.

DRGN Armor

DRGN armor is a Combat Suit of unknown purpose developed by Trident's RMBK facility on the planet Rhand. It has all the features of a standard Combat Suit, as well as built-in ice and rock climbing equipment, and is made of a metallic material whose purpose and origin remains unknown. RMBK efforts in weapon research were strictly forbidden by the Starguild, and the security under which the program was run had not been penetrated before the unexpected Spectral invasion.

2.2

POWER ARMOR

Power Armor is a full coverage exoskeleton with power supply and servos. First developed by the Dragoncrests, it was adopted by the Seven Worlds because it maximized the effectiveness of their limited manpower. The Imperium was forced to begin fielding Power Armor units in response, although they still prefer more numerous, and cheaper, non-power units.

Power Armor requires the user to have surgically implanted reference nodes. These nodes are small metal plates implanted on the bone to monitor and control limb and suit movement. It provides night vision, acts as a vacuum isolation suit, and can withstand temperatures up to 800 degrees Fahrenheit for extended periods. It can filter breathing air from the atmosphere, but normally draws from its own air tanks. In hand-to-hand combat, the wearer does six (6) times normal damage.

Power Unit

Power Armor runs off a rechargeable power unit which is usually recharged after every 24 hours of operation. Recharge may be performed using a **Power Receiver, Grav Vehicle** power plant, or **Expendable Power Pack (EPP).** The number of EPP required to recharge the power unit is given in the Armor Data Table under the EPP column. EPP are portable, single use power cells. Each weighs ten pounds.

Bicomp

The Bicomp is the suit's computer and target designator. It regulates suit movement, sensors, equipment, communications, and balance, and passes all significant information to the suit's wearer. In action, the wearer and the Bicomp are a team with the best attributes of both human and computer.

The **Bicomp 8** is a state of the art processor. It responds to voice and physical commands and can be programmed to take control of some suit functions if the user becomes incapacitated. Simple activities, such as activating medical circuits, maintaining communications, and crawling toward safety, are possible; other actions, such as aiming and firing, or walking upright, are not a part of standard programming. The Bicomp 8 is a sophisticated processor capable of complex programming, but does not have its own intelligence. It is capable only of preprogrammed decisions.

Trident's RMBK team on Rhand was working secretly on a Bicomp with artificial intelligence, called the **Bicomp 9.** Such research violated all conventions of the Starguild, and the project was destroyed during the Spectral invasion of Rhand.

Medical Aid

Power Armor contains all the medical aid features of a Combat Suit, in addition to an **Auto-Medic Kit (Living Steel,** Section 3.4) and an improved puncture repair system. The improved sealing system allows the user to roll a 1-20 number in determining whether the sealing system functions or fails (Combat Suit, Section 2.1).

The armor also contains 12 injectable drug cartridges **(Living Steel,** Section 3.4). These injections may either be self-administered or given to others. When administered to others, a special port in the tip of the index finger is used. To inject a person wearing Power Armor, the injection must be made through a special port at the base of the helm, which takes 8 Action Counts.

Armor Panels

Power Armor has replaceable armor panels which mount to an internal structural frame. The frame provides all joints, hydraulic mounts, equipment mounts, and structural strength. The size and strength of the frame depends on the suit's **Combat Load** and armor weight.

Power Armor comes in a number of models, each designed around a particular frame, and to fill a particular role. In the Starforces there are three primary roles; heavy, medium, and light Power Armor. Each differs in gross weight and resulting

ground pressure, which determines what applications it may be used for. Heavy Power Armor is used in ground combat, Medium Power Armor within buildings and structures, and Light Power Armor within Starfleet vessels. Starforces have optimized a specific model for each role. These models are not interchangeable.

The Seven Worlds does not have the luxury of specific models to fit each combat role. Their Power Armor is designed to handle all roles by making their armor panels non-load bearing and easily removable. Starforce armor panels can only be replaced at a repair facility.

Seven Swords armor panels can be removed, in part or totally, under field conditions and without affecting the suit's function. Anyone skilled with Power Armor may make the adjustment, although usually repair technicians do the work. The Bicomp will automatically adjust for changes in mass loading. The standard heavy frame can therefore be easily adjusted to function as either Medium or Light armor in just a few minutes. While not as efficient as its Starforce counterparts, this ability allows a Seven Swords Power Armor soldier to serve in all types of combat, minimizing the Seven Worlds personnel needs, and also allows the armor panels to be replaced with special function panels such as smoke devices, small grenade launchers, and electronics packages. These are referred to as **Auxiliary Packs** (See Section 2.5.).

Hydraulic System

The suit's motion is powered by two redundant hydraulic systems. Either one will provide full function. The two for one redundancy improves reliability and survivability. It also provides the capability for **boost power,** which uses both hydraulic systems simultaneously, rather than one. It consumes twice the power and generates twice the waste heat, but allows the user to jump further, accelerate quicker, and produce greater static strength.

Boost power is limited to short emergency actions, and can fatigue and damage the suit if used at full Combat Load. In game terms, this allows someone using Boost Power to perform certain actions which are beyond the suit's normal limitations. The wearer may jump 40% further, lift or push with twice as much force, or carry 4 times normal Combat Load at low speeds (2 HPP maximum). Each phase the wearer attempts to prolong one of these feats, or moves at a higher speed, there is a 10% chance of significant damage being done to the structure of the suit. Each time damage occurs, the Action Count cost for all uses of the limb involved is doubled.

"Death is the only acceptable form of amnesty."

Captain Austine D. Blackwell

Defensive Systems

Even with its tremendous offensive capabilities, Power Armor is primarily a defensive system. It was originally designed to protect the wearer from explosive concussion and penetrating damage, and the power necessary to move the armor naturally resulted in greater carrying capacity. This in turn allowed heavier and more lethal weapons to be carried, as well as the wide variety of sophisticated defensive measures built into the armor.

To confuse enemy auto-detection and targeting systems, the outside of a suit of Power Armor has **radar damping surfaces** and a passive **spectrum regulation system.** This system controls the reflection of light striking the armor, allowing it to produce any color or pattern of colors desired. This provides a chameleon-like ability and enhances stealth and concealability in any environment. Pattern color and shape are controlled by the suit's Bicomp. In noncombat conditions, this system is used to display badges of rank, unit logos, and color schemes which take the place of uniforms.

The release of heat is kept to a minimum, and is directionally emitted from the backpack. This reduces the thermal profile when viewed from the front. In an emergency, the suit can go to maximum shutdown, with waste heat stored in a **thermal dam.** This dam has a one hour capacity in maximum shutdown mode, and a one minute capacity at normal operation. After that time, normal thermal emission must be resumed to prevent overheating. This thermal dam can be emptied by spending one minute at maximum shutdown with normal thermal emission.

Visual Sensors

Power Armor contains two sets of visual sensors; a wide angle **Bifocal Unit** mounted on top of the helm and a tight angle **Gun Camera** mounted at eye level on the external armor visor.

The Bifocal Unit acts as the eyes of a man in Power Armor when he has his **Armor Visor** closed. It is a multiwave optical camera and millimeter radar, which provides bifocal optical light amplifying imaging as well as radar ranging and imaging. This means that the wearer can see through fog, clouds, and common smoke screens, as well as being able to magnify individual objects as a 40x telescope.

The Armor Visor is an opaque armor plate protecting the eyes. If the Bifocal Unit is destroyed, the Armor Visor must be opened if the wearer desires unrestricted vision. With the Armor Visor open, protection of the Eye—Nose hit location is provided only by a transparent shield of PF = 10, shown in the armor table as the Visor.

Each time a target in Power Armor is hit in the **Forehead** or **Head Glance** hit location, there is a 25% chance that the hit strikes the Bifocal Unit. If the Bifocal Unit is hit by a shot whose RID is greater than 10, the unit is destroyed. Further penetration is resisted by the suit's external armor.

The Gun Camera is mounted outside the Armor Visor and is provided so the user can fire weapons which have no Advanced Aiming System with his Armor Visor closed. If the Gun Camera is destroyed, and the user does not open his Armor Visor to aim, he fires with an ALM modifier of −4. Each time a person in Power Armor is hit in the Eye—Nose hit location there is a 10% chance the Gun Camera is hit. If the shot's RID is greater than 10, the Gun Camera is destroyed. Further penetration is resisted by the suit's Armor Visor.

"Standing behind the girl won't do you any good, she'll only stop 3 points."

Ronald Unreasonable
King of Vissers

The Armor Visor also includes an external holographic display. This display is often used to project the user's face during normal conversation, thereby improving personal communications and interactions. This display is controlled by the suit's Bicomp and may be used to display maps and information, diagnostics and schematics, or video imagery. Troops often use it to personalize their armor, although such display violates regulations.

As stated earlier, Starforce weapons are equipped with an optical and millimeter wave radar sighting system. These Advanced Aiming Systems (AAS) function much like today's optical scopes, but provide light amplifying and radar imaging as well as radar ranging. Power Armor is equipped with a hand grip pickup which hooks it directly to the Advanced Aiming System. The AAS is thus directly connected to the suit's target designator screen bypassing the external gun camera. This allows Power Armored troops to use the weapon mounted AAS as a remote visual sensor. The AAS provides only tight angle field of view, but is useful since the weapon can be stuck around cover for observation and firing without exposing the user.

For unrestricted movement and visibility, all visual sensors must be fully functional. If a character loses his weapon's AAS, he may switch to his Armor Visor's Gun Camera without penalty. If both the AAS and Gun Camera are out, he may use his Bifocal unit for aiming with an ALM of −4, or open his Armor Visor for unrestricted aim.

If the Bifocal unit is out, the character may use his Gun Camera or AAS for limited vision. He can fire his weapon without penalty but his movement is limited to 2 HPP and his Field of View drastically reduced. Opening his Armor Visor frees him of any visibility restrictions.

Ground Sensors

Power Armor has both active and passive ground seismic sensors which warn of potentially dangerous footing or structures that will not support the user's weight. They are located in the feet of the suit and in passive mode can sense the movement of ground vehicles in the distance.

Ultrasonic Sensors

Power Armor has ultrasonic sensors which allow the user to navigate in smoke screens. This system is used whenever the standard optical and radar systems are

blocked. Its image resolution is coarse and it cannot pick up objects smaller than six inches in size. When the user is stationary this system can be used as a motion detector. As a motion detector it has a range of 100 hexes and resolution of six inches. This system is located with the Bifocal Unit. If the Bifocal Unit is destroyed, the Ultrasonic Sensors are also destroyed.

2.3

POWER ARMOR CHARACTER GENERATION

Power Armor is a self contained, hydraulically powered weapon system. Because of its hydraulic nature, the user's running speed and the load that can be carried are more a function of skill and suit design than strength. The speed the user can maneuver, his Combat Actions, is still to some extent a function of strength.

Maximum Speed

A Power Armored character's Maximum Speed (MS) depends on his Power Armor skill and suit design. This Maximum Speed, in hexes per phase, is found on the Power Armor Data Table and does not depend on his Strength characteristic. This speed assumes the user is at least 7th skill level in the Qualified Skill of Power Armor. If he is 4th to 6th level, his Maximum Speed is one-fourth the value listed. If he is 1st to 3rd level he cannot move safely over speeds of 2HPP.

Combat Load

The Combat Load is the maximum equipment weight that can be carried into combat. This weight is given in the Power Armor Data Table and depends on suit design. It is limited by the suit's structural capability during combat accelerations and is based on weights in a one "g" environment. Even if fighting in low "g" conditions, this Combat Load cannot be exceeded; it is the mass that limits the suit, not the weight.

Noncombat Load

In noncombat conditions where the user can carefully and slowly walk and maneuver, the suit's Combat Load can be exceeded through the use of Boost Power. Up to four times the Combat Load can be carried at low speed (less than 2HPP), but no quick accelerations or movement are possible. This is discussed in greater detail in the Section 2.2, on the Hydraulic System.

Combat Actions (CA)

A Power Armored character's Combat Actions (CA) depend on his Strength, Agility, and skill. While the Power Armor provides the actual power for motion, it is the user's abilities which dictate the speed commands can be carried out.

To find a Power Armored character's Combat Actions (CA), find his Maximum Speed (MS) using **Tables 3A** and **3B (Living Steel)** for an Encumbrance of 10 lb. Cross-index this MS with his Intelligence Skill Factor on Table 3D to find his CA. Note that this MS is used to find the CA only; his actual maximum running speed is given on the Power Armor Data Table.

2.4

POWER ARMOR DESCRIPTIONS

The following are a number of Power Armor models used during the Third Seven Worlds—Starguild war and Spectral invasion. The majority of these are Starguild models.

Heavy Combat Power Armor (HCPA)

HCPA is the standard Starforce ground combat model. Its gross weight is 900 pounds and is limited by its resulting ground pressure. Heavier models are too heavy

for common ground conditions and the 900 lb gross weight limit has become standard. Eighty percent of all Starmarine Power Armor units are armored in HCPA.

Medium Combat Power Armor (MCPA)

MCPA is found in Medium Power Armor units and is used in areas where the footing, whether ground, building, or other structure, will not support the weight of HCPA. MCPA units are used in city and street fighting and are made up of recruits showing the highest initiative and morale, as these play a key role in close combat.

"Like Heavy Metal? . . . . How about 900 lbs. . ."

Imperial Guard recruiting poster

Light Combat Power Armor (LCPA)

LCPA is Starfleet Power Armor designed for use onboard military starcraft, as MCPA and HCPA are too heavy for this role.

While Power Armor is a minority within Starmarine forces, the Starfleet infantry which serves in space is entirely Power Armor trained and equipped. They are a small and highly trained body of men, and are rarely employed in ground combat.

Skiffdress

Skiffdress is a light Starfleet Power Armor designed for use on commercial starcraft. Commercial vessels are not built to military code and cannot be counted on to support the weight of LCPA. All boarding and search of commercial vessels is handled by Skiffdressed Starfleet power infantry.

Slow Cargo Carrier (SCC)

SCC is designed specifically for supporting non-power infantry. It has a maximum speed sufficient to keep pace with non-powered infantry, and a high Combat Load. It is used by Starmarine forces, and a few Landcaste elite units, to carry ammunition, Battlepacks, and heavy ordinance.

Fast Cargo Carrier (FCC)

FCC is similar to SCC and serves a similar support function, except that its greater Maximum Speed allows it to keep up with power infantry. It serves as ammunition and heavy weapons bearer for Power Armor units.

Scout

Scout Power Armor is used by forward observers and scouts. It is a high speed Power Armor with expanded sensor and communication payload.

Crew

Crew Power Armor is worn by the crew of fighting vehicles. It protects them from shrapnel and concussion, thus improving overall vehicle survivability. It has extended life support and communications capability, designed to improve a downed man's chance of rescue.

7SPA Seven Swords Power Armor

7SPA was developed on the Seven Worlds long before the Starguild introduced Power Armor into service. It is based on Dragoncrest Power Armor, and was developed during the Seven Worlds' many battles with the Dragoncrests and the Starguild.

Currently, 7SPA is the ultimate in human Power Armor systems. Its principal weapon is the Seven Swords Battlepack, but a variety of auxiliary packs round out the system. These auxiliary packs are unique to the user's tastes and style of combat. Dozens of varieties are in use; a few have been listed in Section 2.5.

Seven Swords Power Armor can be adapted to three configurations, all of which are derived from the same model. The first has a ground pressure equivalent to Starforce HCPA. The second has an outer layer of armor panels removed, reducing the ground pressure to MCPA class, while the third has been stripped to its basic frame and has a ground pressure equivalent to Starforce LCPA. This configuration is used for Starfleet operations.

SEVEN SWORDS AUXILIARY PACKS

The following are a number of Seven Swords Auxiliary Packs. These units attach directly to the power armor's frame or armor panels. The weights and PF protecting the pack mechanism are given in the left column of the **Weapon Data Tables** or with each pack description in the text that follows.

***7SFP-AP Flechette Pistol** Weight = 4.2 Weapon PF = 8

This Seven Swords Flechette Pistol is installed in the outer forearm armor panel. Seven Swords Battlepacks are armored systems whose weight limits their quick response ability. The 7SFP-AP gives the user a fast, light weapon in his off-hand. Rather than traverse the heavy Battlepack in response to surprise, the user can rapidly swing his 7SFP-AP to bear.

Weapon data for the 7SFP-AP is found in the Point Fire Weapon section. It has its own gun camera.

***7SGP-AP Grenade Pistol** Weight 4.5 Weapon PF = 8

Small Grenade Pistol installed in the outer forearm armor panel. Weapon data is found in the Explosive Direct Fire Weapon section. It has its own gun camera and must be manually reloaded.

7SSP-AP Scatter Pack Weight 3.0 Weapon PF = 8 Ammo 1.0

The 7SSP-AP may be mounted to the shoulder near the base of the helm, or to the inner wrist panel. It is a single use explosive which fires flechettes in a 60 degree cone. The number of hits on targets in this cone is the same as for a **G-F8C Heavy Fragmentation Grenade,** but the RID and DC of each hit is as if it were from an **M-F8B Flechette Mine** (Grenades and Explosives section). The shoulder mounted unit pivots to cover the 180 degree field of fire off the shoulder, in three 60 degree sections.

Each unit takes 1 Action Count to traverse 60 degrees and may be fired as it bears (No odds of hitting rolled) The Ammo entry gives the weight of a Scatter Pack reload. Reloading must be done manually and takes 12 AC.

7SSm-AP Smoke Generator Weight 3.2 Mech PF = 8 Reload 2.4

The Smoke/Chaf auxiliary pack mounts to the front or rear thigh panel. It is a multiple use smoke/chaf generator which creates an opaque smoke screen of radius 2 hexes (Smk = 4). The unit may be started and stopped upon command, with total smoke generation per charge of 60 phases. The smoke is generated at the user's position. If he is moving a screen can be laid. This screen is one hex wide and follows the user's path during generation. It last 20 phases and blocks vision, radar, and infrared detection. It reduces the RID of lase fire by 10 points per hex crossed.

7SSmL-AP Smoke Launcher Weight 3.0 Mech PF = 8 Reload 1.8

Shoulder mounted Smoke Launcher with a 180 degree field of fire off the shoulder. When fired it creates a smoke screen one hex wide traveling 7 hexes per phase for two phases. The smoke has the same effects as that in the 7SSm-AP entry. It may be fired three times before reloading, and each reload contains three charges.

7SED-AP Explosive Damper Weight 5.4 Mech PF = 8 Reload 4.5

Thigh mounted anti-explosive package which covers an area of 1 to 4 hex diameter centered about the user in airgel. This airgel is opaque, last 60 phases, and has the effects of smoke/chaf given in the 7SSm-AP entry. In addition to screening, it dampens the concussion effects of explosives (Blast Modifier = 0.1). It will dampen only one blast, after which it is atomized. When activated, the screen forms almost instantly (5MPC) in a circular pattern. Up to 16 one hex, 4 two hex, 2 three hex, or 1 four hex diameter pattern can be made per pack.

3.1

POINT FIRE WEAPONS

Detailed weapon data is provided in the following sections. This data is used by both **Living Steel** and the **Phoenix Command Combat System.** Those familiar with the combat system will recognize most of the weapon values. The shaded and optional values are used with the **Advanced Phoenix Command Combat Supplement** and should not be used with the basic system.

This section is devoted to pistols, sub-machineguns, rifles, and machine guns. In the interest of space and efficiency, the values presented have been abbreviated.

Length (L)
Folded and deployed weapon length in inches.

Weight (W)
The loaded weapon weight in pounds. Does not include a holster or sling.

Reload Time (RT)
The time, in Action Counts, required to fully reload the weapon.

Rate Of Fire (ROF)
The time, in Action Counts, required to chamber a round from the weapon's magazine.

An asterisk (*) indicates a self-loading action in which a round is chambered automatically after each shot fired. With this type of weapon, a round is always ready for fire until the magazine is empty.

A number following an * indicates the weapon is capable of fully automatic fire and gives the number of rounds fired per half second burst.

A double asterisk (**) indicates the weapon has three round burst capability, which is defined in the Advanced Phoenix Command Combat Supplement. A number after a ** indicates it is also capable of fully automatic fire and is the number of rounds fired per half second burst. Weapons marked with an *V or **V are capable of variable rates of fully automatic fire.

Weapons with no ROF entry have no magazine; the time required to prepare a shot is given by the Reload Time (RT).

Lase weapons have a number of power settings rather than ammunition types in the Ballistic Data section of the Weapon Data Tables. The first setting, marked (1), is for single shot fire, and uses a single charge from the power pack. The other settings are for fully automatic fire and are the Rates Of Fire (ROF) in shots per burst. Each of these uses three charges from the power pack. Note that the RID value for a lase weapon in fully automatic fire is less than the full power single shot setting. The RID of each round of a Three Round Burst is given by the (6) round autofire entry.

Ammunition Capacity (Cap)
The maximum number of rounds held in the weapon's magazine. A lase weapon's Cap gives the number of full power single shots which may be fired per power pack. Each burst of fully automatic fire uses three single shot charges, independent of the ROF.

Ammunition Weight (AW) and Feed Device
The ammunition weight in pounds per magazine (Mag), power pack (Pck), or individual round (Rnd).

Sustained Automatic Burst (SAB)
The measure of weapon accuracy during long bursts of automatic fire.

Aim Time Modifier (Aim Time Mod)
The combined measure of the weapon's accuracy and speed of aim. There are several Aim Time Modifiers, one for each Aim Time listed in the 3rd column. The greater the Aim Time Modifier, the greater the weapon's accuracy.

Relative Impact Damage (RID) / Damage Class (DC)

The RID measures bullet penetrating power. The DC measures bullet damage capability. The greater the RID and DC, the greater the penetration and damage. The RID and DC are given for target ranges 10, 20, 40, 70, 100, 200, 300, 400, and 600 hexes. A hex is two yards across. There are three sets of RID and DC values. Each set represents a different type of ammunition as given to the left of these values: **Armor Piercing (AP), Explosive (Exp), Full Metal Jacket (FMJ), High Explosive (HE), High Explosive Anti-Tank (HEAT), Jacketed Hollow Point (JHP), Soft Steel Dart (SSD),** or **Steel Dart (SD).**

Players not using the **Advanced Phoenix Command Combat Supplement** should not use weapon data from the shaded portion of the tables. The shaded regions represent performance beyond the weapon's Effective Range and require the use of special rules.

Minimum Arc (MA)

The minimum number of hexes over which a burst of fully automatic fire must be spread. The greater the weapon's recoil, the greater the Minimum Arc.

Ballistic Accuracy (BA)

The measure of weapon/ammunition accuracy potential. The larger the BA, the greater this potential. This is used only with the **Advanced Phoenix Command Combat Supplement.**

Time Of Flight (TOF)

The projectile's time of flight in tenths of seconds (Master Phasing Counts (MPC)). This, too, is used only with **Advanced Phoenix Command.**

Reliability Class (RC) and Burst Reliability Class (BRC)

The RC and BRC give the chance of weapon malfunction in tenths of percent for each single shot fired (RC) or half second burst of automatic fire (BRC). The larger the RC or BRC, the more unreliable the weapon. An * preceding the RC or BRC indicates the malfunction chance is in percent.

Clear Jam Time (CJT) and % Clear Jam (%CJ)

The CJT gives the time, in Action Counts, required to attempt to fix a weapon which has malfunctioned. After each CJT Action Counts spent attempting to fix the weapon, the player has a % Clear Jam (%CJ) chance of fixing the weapon.

Hand-To-Hand Combat Values

The Hand-To-Hand combat values are for use with **Living Steel,** and with the **Phoenix Command Hand-To-Hand Combat System.**

The **Weapon Speed (WS)** measures the relative quickness of the weapon, and the Weapon Class (WC) measures weapon accuracy. The greater the WS and WC, the faster and more accurate the weapon. The **Range (R)** gives the weapon's combat range in 2 foot hexes, while the **Impact Damage (ID)** measures weapon impact. The greater the ID the more severe the blow. A number in parentheses such as (8) indicates a roll of an eight-sided die. E.g., (8) + 2 is the roll of an eight-sided die plus 2. ID values are given for three types of blows: **overhead smashes** with the weapon butt (IDb), **stabs** (IDs), and **cuts** (IDc). A weapon with no bayonet uses the Blunt damage table for smashes or cuts, and the **Flange** table for stabs. Weapons fitted with a bayonet use the **Blunt** table for a smash, **Stabbing** table for a stab, and either **Cutting** or **Blunt** table for a cutting blow.

3.2

EXPLOSIVE DIRECT FIRE WEAPONS

Explosive Direct Fire Weapons include rocket launchers, grenade launchers, and rocket propelled grenades. They are listed in a separate section of this supplement as their entries differ somewhat from those of the standard small arms.

The Explosive Direct Fire Weapon Tables have been divided into a left and right-hand side. The values on the left side are identical to those in the Point Fire Weapon section. The RID and DC values on this side give the projectile's penetration and damage capability. The values on the right side represent the projectile's explosive effects. These RID and DC give the explosive's shrapnel penetration and damage, depending on target range from burst in 2 yard hexes. The **Base Shrapnel Hit Chance (BSHC)** gives the percent chance of hitting each target in the burst area with shrapnel. The **Base Concussion (BC)** measures blast concussion damage. The "C" entry is for a target in Contact with the explosive.

The **Angle Of Incidence (AOI)** measures the projectile's striking angle. This value will be used in the **Phoenix Command Mechanized Combat System.**

3.3

GRENADES AND EXPLOSIVES

As with Explosive Weapons, the RID and DC for Grenades and Explosives measure shrapnel penetration and damage, the BSHC the chance of hitting with shrapnel, and the BC the concussion damage, depending on target range from burst in 2 yard hexes. The **Arm Time** is the time, in Action Counts, to arm the explosive; and the Range, the distance it can be thrown in 2 yard hexes.

Non-Powered Armor Data Table

Non - Powered Armor	Armor Weight			Armor Protection Factor (PF)				BPF		
	No Life Support	With Air Filtration	Full Life System	Helm	Visor	Body	Limbs	Head	Body	Limbs
Light Flexible Armor	2.0	-	-	-	-	4	-	-	1	-
Medium Flexible Armor	2.5	-	-	-	-	6	-	-	2	-
Heavy Flexible Armor	3.0	-	-	-	-	10	-	-	3	-
Basic Combat Suit	7.4	13.7	17.7	4	4	2	2	3	1	1
with Level 1 Armor Panels	13.9	20.2	24.2	10	10	16	2	4	3	1
with Level 2 Armor Panels	29.3	35.6	39.6	20	10	30	2	5	5	1
with Level 3 Armor Panels	37.1	43.4	47.4	20	10	40	2	5	6	1
with Level 4 Armor Panels	47.1	53.4	57.4	30	10	50	2	7	6	1
with Level 5 Armor Panels	56.2	62.5	66.5	40	10	60	2	8	7	1
DRGN Combat Suit	10.0	16.3	20.3	2	2	2	2	2	1	1

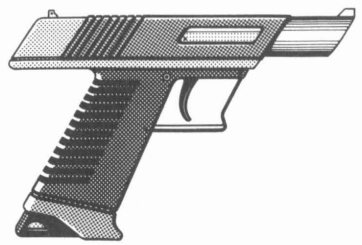
Power Armor Data Table

Power Armor Model	Gross Weight (lb)	Ground Pressure	Combat Load (lb)	Maximum Speed (HPP)	Life Support		Power Unit			Armor Protection Factors								BPF
					Cap (hr)	Expend. (lb)	Cap (hr)	Weight (lb)	EPP #	Helm	Armor Visor	Visor	Body	Limbs	Hands	Bfcl Unit	Gun Cam	
Starforce																		
Heavy (HCPA)	900	12	110	7	41	12	24	48	4	100	100	10	100	100	40	10	10	10
Med (MCPA)	600	8	50	7	41	12	24	36	3	60	60	10	60	60	40	10	10	9
Light (LCPA)	450	6	30	7	41	12	24	32	3	30	30	10	30	30	40	10	10	8
Skiff	300	4	12	7	20	6	18	12	1	10	10	10	10	10	10	-	-	7
Cargo (SCC)	900	12	280	4	41	12	24	24	2	60	60	10	60	60	40	10	10	9
Cargo (FCC)	900	12	240	7	41	12	24	48	4	60	60	10	60	60	40	10	10	9
Scout	900	12	86	10	41	12	24	85	7	70	70	10	70	70	40	10	10	9
Crew	450	6	45	7	96	28	48	66	6	10	10	10	10	10	10	10	10	7
Seven Sword																		
7SPA (Hvy)	900	12	120	7	24	7	24	48	4	100	100	10	100	100	40	10	10	10
(Med)	600	8	20	7	24	7	18	24	2	50	50	10	50	50	40	10	10	9
(Lgt)	450	6	20	7	24	7	24	24	2	10	10	10	10	10	40	10	10	7

Starguild Weapons

AP5-8 / Landcaste

6mm Automatic Pistol



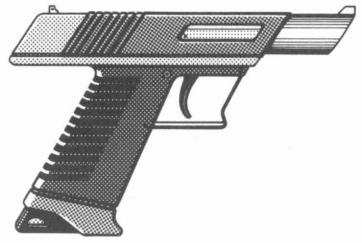
Standard Landcaste Law Enforcement & Starfleet pistol. Known for its high capacity, light recoil, and accuracy, it was introduced in 2053 and since then has been very successful.

Physical Data		Aim Time AC	Aim Time Mod
L	7	1	-18
W	2.8	2	-11
		3	-10
RT	3	4	-9
ROF	*	5	-8
		6	-7
Cap	25		
AW	.46 Mag		
SAB	3		

Ballistic Data		Target Range In 2 Yard hexes									Optional Data	
		10	20	40	70	100	200	300	400	600		
FMJ	RID	4.9	4.6	4.1	3.5	3.0	1.7	1.0			RC	2
	DC	3	3	3	3	2	1	1				
JHP	RID	4.7	4.4	4.0	3.4	2.9	1.7	1.0			CJT	4
	DC	5	5	5	4	4	2	1			%CJ	90
AP	RID	14	13	12	10	8.4	4.9	2.8			WS	2.4
	DC	3	3	3	3	2	1	1			WC	0
											R	1
											IDb	(6)+3
	BA	61	53	44	37	32	22	17				
	TOF	0	1	2	3	4	9	15				

AP6-8 / Landcaste

7mm Automatic Pistol



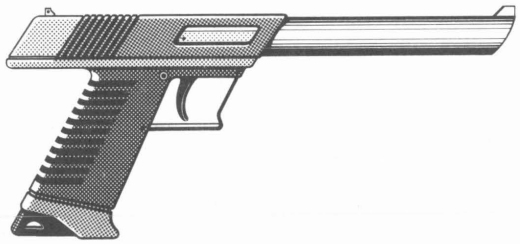
Standard sidearm of the Landcaste military. Providing more stopping power than the AP5-8, today it is used only by Landcaste forces. Starmarine forces prefer the AP7-8.

Physical Data		Aim Time AC	Aim Time Mod
L	7	1	-18
W	3.5	2	-12
		3	-10
RT	3	4	-9
ROF	*	5	-8
		6	-7
Cap	21		
AW	.51 Mag		
SAB	4		

Ballistic Data		Target Range In 2 Yard hexes									Optional Data	
		10	20	40	70	100	200	300	400	600		
FMJ	RID	5.8	5.5	5.0	4.2	3.6	2.1	1.2	.7		RC	2
	DC	5	4	4	4	3	2	1	1			
JHP	RID	5.6	5.3	4.8	4.0	3.4	2.0	1.2	.7		CJT	4
	DC	6	6	6	6	5	3	1	1		%CJ	90
AP	RID	16	16	14	12	10	5.9	3.4	2.0		WS	2.3
	DC	4	4	4	4	3	2	1	1		WC	0
											R	1
											IDb	(8)+2
	BA	60	51	42	35	30	20	15	11			
	TOF	0	1	1	3	4	8	14	20			

AP7-8 / Landcaste

7mm Automatic Pistol



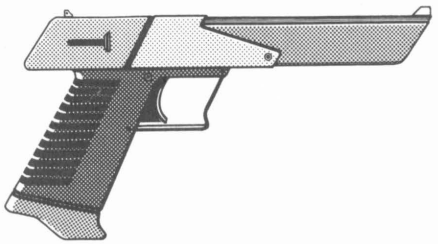
Long barrel version of the AP6-8 known for its accuracy and power. It is the standard pistol of Starforces and was used by professional & mercenary forces during the Dragoncrest Wars.

Physical Data		Aim Time AC	Aim Time Mod
L	11	1	-18
W	3.6	2	-11
		3	-10
RT	3	4	-9
ROF	*	5	-8
		6	-7
		7	-6
Cap	21		
AW	.51 Mag		
SAB	5		

Ballistic Data		Target Range In 2 Yard hexes									Optional Data	
		10	20	40	70	100	200	300	400	600		
FMJ	RID	7.4	7.0	6.4	5.5	4.7	2.8	1.7	1.0	.4	RC	2
	DC	5	5	5	4	4	3	2	1	1		
JHP	RID	7.1	6.7	6.1	5.2	4.5	2.7	1.6	1.0	.4	CJT	4
	DC	7	7	7	6	6	4	2	1	1	%CJ	90
AP	RID	21	20	18	15	13	7.9	4.8	2.9	1.0	WS	2.3
	DC	5	5	5	4	4	3	2	1	1	WC	-1
											R	1
											IDb	(8)+2
	BA	60	51	43	35	30	21	15	11	6		
	TOF	0	1	1	2	3	7	12	17	29		

FMP8 / Landcaste

1.5mm Flechette Machine Pistol



Compact machine pistol popular with bodyguards and undercover agents. Its short effective range limits its use as a standard military weapon.

Physical Data		Aim Time AC	Aim Time Mod
L	8	1	-18
W	2.8	2	-11
		3	-10
RT	5	4	-9
ROF	*12	5	-8
		6	-7
Cap	60		
AW	.29 Mag		
SAB	1		

Ballistic Data		Target Range In 2 Yard hexes									Optional Data	
		10	20	40	70	100	200	300	400	600		
SD	RID	17	16	14	12	10	6.0	3.5	2.0		RC	1
	DC	2	2	2	1	1	1	1	1		BRC	*1
SSD	RID	16	15	14	12	9.9	5.7	3.3	1.9		CJT	3
	DC	3	3	2	2	2	1	1	1		%CJ	90
AP	RID	47	45	40	34	29	17	9.8	5.7		WS	2.4
	DC	2	2	1	1	1	1	1	1		WC	0
											R	1
	MA	.2	.3	.6	1	2	3	5	6		IDb	(6)+3
	BA	32	26	18	12	7	-2	-7	-11			
	TOF	0	0	1	1	1	3	5	8			

Starguild Weapons

FMPX8 / Landcaste

2.8mm Flechette Machine Pistol

High power machine pistol popular with infiltration & high level security teams It can penetrate Power Armor but has a limited range.

Physical Data		Aim Time AC	Aim Time Mod
L	13/20	1	-20
W	5.3	2	-11
		3	-8
RT	5	4	-6
ROF	**6	5	-5
		6	-4
		7	-3
Cap	48		
AW	.95		
	Mag		
SAB	3		

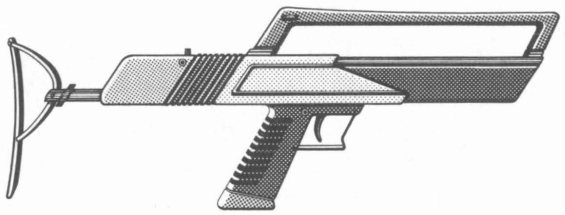
Ballistic Data — Target Range In 2 Yard hexes

		10	20	40	70	100	200	300	400	600
SD	RID	40	38	34	28	24	14	7.6	4.3	1.4
	DC	5	5	4	4	3	3	2	1	1
SSD	RID	39	36	32	27	23	13	7.3	4.1	1.3
	DC	7	7	6	6	6	4	3	2	1
AP	RID	113	107	95	80	68	38	21	12	3.8
	DC	4	4	4	4	3	2	2	1	1
	3RB	-4	1	6	10	13	17	20	22	25
	MA	.3	.6	1	2	3	6	9	12	18
	BA	32	25	18	11	7	-2	-8	-11	-16
	TOF	0	0	1	1	1	3	6	8	13

Optional Data	
RC	1
BRC	6
CJT	3
%CJ	90
WS	2.1
WC	-1
R	1+
IDb	(8)+4
IDc	(4)
IDs	(6)

SMP8 / Landcaste

1.7mm Slivergun Sub-Machinegun



Standard Landcaste Law Enforcement weapon for agents in Bondsmen areas. In Landcaste and Starcaste areas, pistols are issued.

Physical Data		Aim Time AC	Aim Time Mod
L	20	1	-20
W	4.8	2	-11
		3	-8
RT	6	4	-6
ROF	**6	5	-5
		6	-4
		7	-3
Cap	52		
AW	.73		
	Mag		
SAB	2		

Ballistic Data — Target Range In 2 Yard hexes

		10	20	40	70	100	200	300	400	600
SD	RID	42	39	35	30	25	14	8.1	4.6	
	DC	2	2	2	2	2	1	1	1	
SSD	RID	40	38	34	29	24	14	7.8	4.4	
	DC	3	3	3	3	3	2	2	1	
AP	RID	118	111	99	84	71	40	23	13	
	DC	2	2	2	2	2	1	1	1	
	3RB	-6	-1	4	8	10	15	18	20	
	MA	.2	.4	.9	2	2	4	7	9	
	BA	34	29	24	19	16	9	5	2	
	TOF	0	0	1	1	1	3	6	8	

Optional Data	
RC	1
BRC	6
CJT	3
%CJ	90
WS	2.1
WC	0
R	1+
IDb	(8)+3
IDc	(3)
IDs	(6)

SMPGL8 / Landcaste

1.7mm Slivergun SMG 30mm Grenade Lncher

Standard Landcaste squad support weapon with 1.7mm slivergun & 30mm grenade lnchr It fires SMP8 ammo. The Grenade launcher is the primary weap.

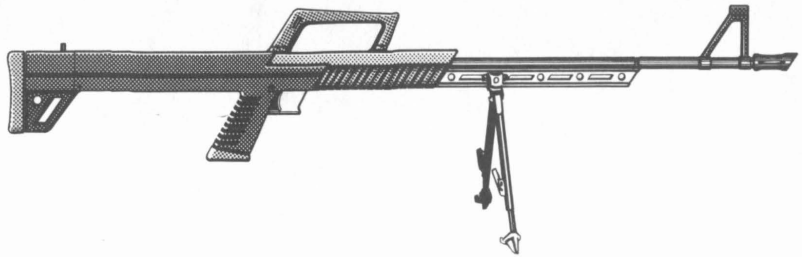
Physical Data		Aim Time AC	Aim Time Mod
L	25	1	-26
W	10.4	2	-12
		3	-9
RT	6	4	-8
ROF	**6	5	-5
		6	-4
		7	-3
Cap	52		
AW	.73		
	Mag		
SAB	1		

Ballistic Data — Target Range In 2 Yard hexes

		10	20	40	70	100	200	300	400	600
SD	RID	42	39	35	30	25	14	8.1	4.6	
	DC	2	2	2	2	2	1	1	1	
SSD	RID	40	38	34	29	24	14	7.8	4.4	
	DC	3	3	3	3	3	2	2	1	
AP	RID	118	111	99	84	71	40	23	13	
	DC	2	2	2	2	2	1	1	1	
	3RB	-6	-1	4	8	10	15	18	20	
	MA	.2	.3	.6	1	2	3	4	6	
	BA	34	29	24	19	16	9	5	2	
	TOF	0	0	1	1	1	3	6	8	

Optional Data	
RC	1
BRC	6
CJT	3
%CJ	90
WS	1.8
WC	-2
R	2
IDb	(12)+3
IDc	(8)+2
IDs	(6)+3

SAR8 / 2.1mm Slivergun Assault Rifle / Landcaste



Short range assault rifle issued to garrison and city troops.

Physical Data		Aim Time AC	Aim Time Mod
L	42	1	-22
W	8.2	2	-12
		3	-9
RT	9	4	-7
ROF	**7	5	-6
		6	-5
		7	-4
Cap	56	8	-3
AW	1.3	9	-2
	Mag	10	-1
		11	0
SAB	4		

Ballistic Data — Target Range In 2 Yard hexes

		10	20	40	70	100	200	300	400	600
SD	RID	64	62	58	52	47	33	23	16	7.8
	DC	4	4	4	3	3	3	2	2	2
SSD	RID	62	59	55	50	45	31	22	15	7.5
	DC	6	6	6	5	5	4	4	3	2
AP	RID	181	174	162	146	131	92	64	45	22
	DC	4	4	3	3	3	3	2	2	1
	3RB	-4	1	6	10	13	18	21	23	26
	MA	.4	.9	2	3	4	9	13	17	26
	BA	34	29	24	19	16	10	6	3	-1
	TOF	0	0	1	1	1	3	5	7	12

Optional Data	
RC	1
BRC	7
CJT	4
%CJ	90
WS	1.9
WC	-1
R	2+
IDb	(10)+4
IDc	(6)+3
IDs	(6)+2

Starguild Weapons	Physical Data	Aim Time AC	Aim Time Mod	Ballistic Data		Target Range In 2 Yard hexes 10	20	40	70	100	200	300	400	600	Optional Data	
AR8L / 4.8mm Assault Rifle / Landcaste	L 28	1	-22	FMJ	RID	36	35	33	30	27	19	14	10	5.3	RC	1
	W 8.5	2	-12		DC	7	7	7	7	7	6	5	4	3	BRC	8
		3	-9													
	RT 9	4	-7	JHP	RID	35	33	31	28	26	19	13	9.7	5.1	CJT	4
	ROF **8	5	-6		DC	9	9	9	8	8	7	7	6	4	%CJ	90
		6	-5													
		7	-4	AP	RID	101	98	92	83	76	55	40	29	15	WS	1.9
	Cap 56	8	-3		DC	7	7	7	7	6	6	5	4	3	WC	-1
	AW 2.1	9	-2												R	2
	Mag				3RB	-4	0	5	9	12	17	20	22	25		
					MA	.5	1	2	3	5	10	15	20	30	IDb	(10)+4
					BA	64	57	50	43	39	29	24	20	15	IDc	(6)+1
Light assault rifle used by Law Enforcement tactical teams.	SAB 4				TOF	0	0	1	1	1	3	5	7	11	IDs	(6)+2
AR8 / 6mm Assault Rifle / Landcaste	L 42	1	-24	FMJ	RID	50	48	46	42	39	30	24	18	11	RC	1
	W 12.0	2	-14		DC	9	9	8	8	8	8	7	6	5	BRC	5
		3	-10													
	RT 9	4	-8	JHP	RID	48	46	44	41	38	29	23	17	10	CJT	4
	ROF **5	5	-6		DC	10	10	10	10	10	9	9	8	7	%CJ	90
		6	-5													
		7	-4	AP	RID	140	136	129	120	111	86	66	51	31	WS	1.7
	Cap 52	8	-3		DC	8	8	8	8	8	7	7	6	5	WC	-2
	AW 2.5	9	-2												R	2+
	Mag	10	-1		3RB	2	7	12	16	19	24	26	29	31		
		11	-1		MA	.5	1	2	3	5	10	15	19	29	IDb	(12)+4
		12	0		BA	64	58	51	44	40	31	25	22	16	IDc	(8)+3
Standard rifle of the Landcaste military.	SAB 5				TOF	0	0	1	1	1	3	5	7	11	IDs	(6)+3
SAW8 / 6.9mm Squad Automatic Weapon / Landcaste	L 42	1	-27	FMJ	RID	61	60	57	54	50	40	32	26	17	RC	1
	W 18.9	2	-17		DC	9	9	9	9	9	9	8	8	7	BRC	4
		3	-11													
	RT 9	4	-8	JHP	RID	59	57	55	51	48	39	31	25	16	CJT	4
	ROF **4	5	-7		DC	10	10	10	10	10	10	10	9	8	%CJ	90
		6	-6													
		7	-4	AP	RID	173	169	162	151	142	114	91	73	47	WS	1.6
	Cap 32	8	-3		DC	9	9	9	9	9	8	8	8	7	WC	-3
	AW 2.5	9	-3												R	2+
	Mag	10	-2		3RB	4	9	14	18	20	25	28	30	33		
		11	-1		MA	.4	.8	2	3	4	8	12	16	23	IDb	(14)+6
		12	0		BA	65	58	51	45	41	32	26	23	17	IDc	(10)+3
Standard Landcaste LMG issued as a squad support weapon.	SAB 5				TOF	0	0	1	1	1	3	5	6	10	IDs	(8)+3
MG8L / 6.9mm Machine Gun / Landcaste	L 42	1	-30	FMJ	RID	61	60	57	54	50	40	32	26	17	RC	2
	W 29.4	2	-20		DC	9	9	9	9	9	9	8	8	7	BRC	8
		3	-14													
	RT 8	4	-10	JHP	RID	59	57	55	51	48	39	31	25	16	CJT	4
	ROF **4	5	-8		DC	10	10	10	10	10	10	10	9	8	%CJ	80
		6	-6													
		7	-5	AP	RID	173	169	162	151	142	114	91	73	47	WS	1.4
	Cap 160	8	-4		DC	9	9	9	9	9	8	8	8	7	WC	-4
	AW 7.2	9	-3												R	3
	Mag	10	-2		3RB	1	6	11	15	18	23	26	28	30		
		11	-1		MA	.3	.5	1	2	3	5	8	11	16	IDb	(20)+5
		12	-1		BA	65	58	51	45	41	32	26	23	17	IDc	(12)+6
Standard Landcaste machine gun issued at the platoon level.	SAB 4	13	0		TOF	0	0	1	1	1	3	5	6	10	IDs	(10)+3

Starguild Weapons

*MG8H / 10.6mm Heavy Machine Gun / Landcaste

Standard Landcaste heavy machine gun with Advanced Aiming System.

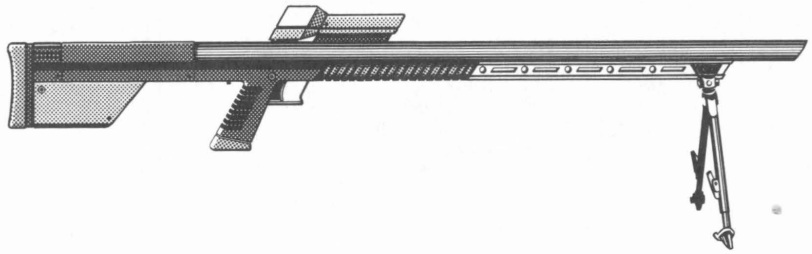
Physical Data		Aim Time AC	Aim Time Mod
L	51	1	-36
W	118.7	2	-25
		3	-20
RT	8	4	-14
ROF	**4	5	-10
		6	-6
		7	-3
Cap	96	8	-1
AW	16.5	9	1
	Mag	10	2
		11	4
		12	5
SAB	3	15	7

Ballistic Data — Target Range In 2 Yard hexes

		10	20	40	70	100	200	300	400	600
FMJ	RID	112	110	107	103	98	85	74	64	48
	DC	10	10	10	10	10	10	10	10	10
JHP	RID	107	106	103	98	94	82	71	61	46
	DC	10	10	10	10	10	10	10	10	10
AP	RID	315	310	302	289	277	240	208	180	135
	DC	10	10	10	10	10	10	10	10	10
	3RB	-2	3	8	12	14	19	22	24	27
	MA	.2	.3	.7	1	2	3	5	7	10
	BA	65	59	53	47	43	34	29	25	20
	TOF	0	0	1	1	1	3	4	6	10

Optional Data	
RC	1
BRC	4
CJT	4
%CJ	80

*GR8 / 1.7mm Gauss Rifle / Starforce



Starmarine weapon with extended range and good penetration.

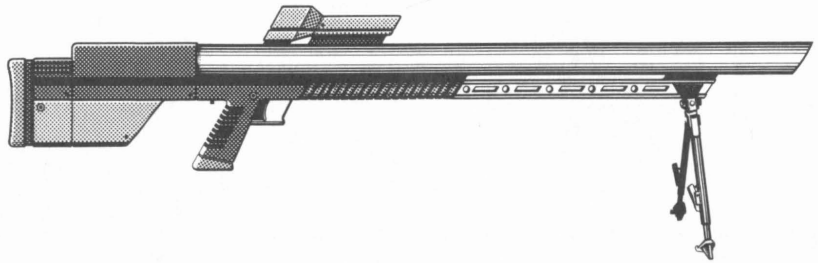
Physical Data		Aim Time AC	Aim Time Mod
L	42	1	-23
W	11.5	2	-12
		3	-8
RT	8	4	-5
ROF	*	5	-2
		6	-1
		7	1
Cap	25	8	2
AW	.20	9	4
	Mag	10	5
		11	6
		12	7
SAB	2		

Ballistic Data — Target Range In 2 Yard hexes

		10	20	40	70	100	200	300	400	600
SD	RID	60	58	53	46	40	26	17	11	4.4
	DC	3	3	3	3	3	2	2	1	1
SSD	RID	58	55	50	44	39	25	16	10	4.2
	DC	5	5	5	4	4	3	3	2	1
AP	RID	169	162	148	130	114	73	47	30	12
	DC	3	3	3	3	2	2	2	1	1
	BA	34	29	24	19	16	10	6	3	-2
	TOF	0	0	1	1	1	3	5	7	11

Optional Data	
RC	1
CJT	10
%CJ	5
WS	1.8
WC	-2
R	2+
IDb	(12)+4
IDc	(8)+3
IDs	(6)+3

*GMG8L / 2.8mm Gauss Machine Gun / Starforce



Standard Starforce machine gun normally handled by a 3 man team.

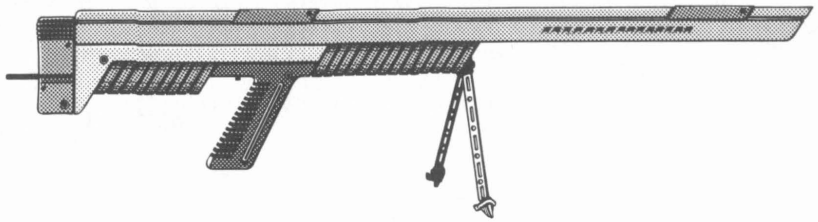
Physical Data		Aim Time AC	Aim Time Mod
L	42	1	-29
W	67.0	2	-18
		3	-12
RT	8	4	-7
ROF	**6	5	-4
		6	-2
		7	0
Cap	144	8	1
AW	3.4	9	3
	Mag	10	4
		11	6
		12	7
SAB	2	13	8

Ballistic Data — Target Range In 2 Yard hexes

		10	20	40	70	100	200	300	400	600
SD	RID	109	106	101	94	87	69	54	42	26
	DC	6	6	6	6	6	6	5	4	4
SSD	RID	104	102	97	90	84	66	52	41	25
	DC	8	8	8	8	8	7	7	6	6
AP	RID	306	299	284	265	246	193	152	119	74
	DC	6	6	6	6	6	5	5	4	3
	3RB	-9	-4	1	5	8	13	15	17	20
	MA	.2	.3	.6	1	2	3	5	6	9
	BA	34	29	24	20	17	11	7	5	1
	TOF	0	0	0	1	1	3	4	6	10

Optional Data	
RC	1
BRC	6
CJT	10
%CJ	5

*BP-GMG8L / 2.8mm Battlepack Gauss Machine Gun / Starforce



GMG8L in a Power Armor Battlepack.

Backpack (5 Mag) W = 57 PF = 5

Weapon W = 35 PF = 5

Physical Data		Aim Time AC	Aim Time Mod
L	42	1	-30
W	92	2	-19
		3	-13
RT	6	4	-7
ROF	**12	5	-4
		6	-3
		7	0
Cap	144	8	1
AW	1.7	9	3
	Mag	10	4
		11	5
		12	6
SAB	1	13	8

Ballistic Data — Target Range In 2 Yard hexes

		10	20	40	70	100	200	300	400	600
SD	RID	109	106	101	94	87	69	54	42	26
	DC	6	6	6	6	6	6	5	4	4
SSD	RID	104	102	97	90	84	66	52	41	25
	DC	8	8	8	8	8	7	7	6	6
AP	RID	306	299	284	265	246	193	152	119	74
	DC	6	6	6	6	6	5	5	4	3
	3RB	-18	-14	-9	-5	-2	3	6	8	11
	MA	.2	.3	.6	1	2	3	5	6	9
	BA	34	29	24	20	17	11	7	5	1
	TOF	0	0	0	1	1	3	4	6	10

Optional Data	
RC	1
BRC	*1
CJT	10
%CJ	5

Starguild Weapons

*BP-GMG8H / 3.3mm Battlepack Gauss Machine Gun / Starforce

HMG in a Cargo Carrier Battlepack.

Backpack (8 Mag) W = 103 PF 5

Weapon W = 54 PF = 5

Physical Data		Aim Time AC	Aim Time Mod
L	42	1	-33
W	157	2	-22
		3	-16
RT	6	4	-11
ROF	**12	5	-6
		6	-4
		7	-1
Cap	144	8	0
AW	2.7	9	2
	Mag	10	3
		11	5
		12	6
SAB	1	14	8

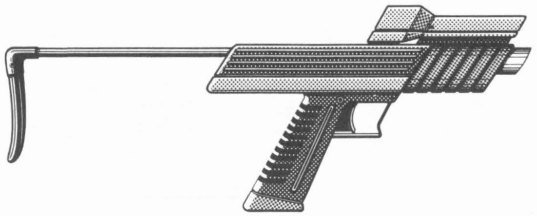
Ballistic Data — Target Range In 2 Yard hexes

		10	20	40	70	100	200	300	400	600
SD	RID	136	134	129	121	115	94	78	64	44
	DC	8	8	7	7	7	7	7	6	6
SSD	RID	131	128	123	116	110	91	75	62	42
	DC	9	9	9	9	9	9	8	8	7
AP	RID	384	377	362	342	323	266	219	181	123
	DC	7	7	7	7	7	7	6	6	6
	3RB	-18	-14	-9	-5	-2	3	6	8	11
	MA	.2	.3	.6	1	2	3	5	6	9
	BA	34	29	24	20	17	11	8	5	1
	TOF	0	0	0	1	1	3	4	6	9

Optional Data	
RC	1
BRC	*1
CJT	10
%CJ	5

*LMP8 / Starforce

Lase Machine Pistol



Standard weapon of Starfleet Infantry. Designed for use on Starfleet vessels with multiple power settings limiting penetration and damage to the vessel.

Physical Data	
L	11/20
W	5.7
RT	3
ROF	**V
Cap	1310
AW	.4
	Mag
SAB	1

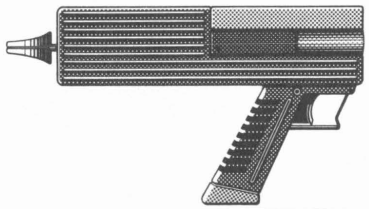
Aim Time AC	Aim Time Mod
1	-19
2	-9
3	-6
4	-3
5	-1
6	0
7	2

Ballistic Data		10	20	40	70	100
(1)	RID	146	142	26		
(4)	RID	36	35			
(6)	RID	24	23			3RB
	DC	2	2	5		
(10)	RID	3.5	3.2			
(18)	RID	1.9	1.7			
	DC	5	5			
	3RB	-5	0	5		
	MA	.2	.2	.3		
	BA	70	65	60		

Optional Data	
RC	1
BRC	1
WS	2.1
WC	-1
R	1
IDb	(8)+4

*DRGN / Trident RMBK

Lase Machine Pistol



Advanced LMP built by Trident's RMBK Division on Rhand standard date 2347. Weapons were not exported from Rhand before the Spectral invasion.

Physical Data	
L	14
W	6.8
RT	3
ROF	**V
Cap	560
AW	.4
	Mag
SAB	1

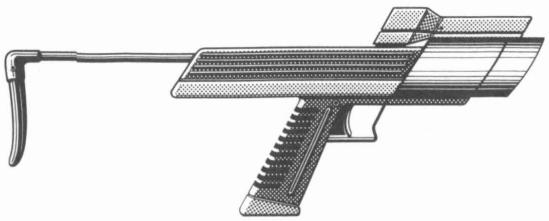
Aim Time AC	Aim Time Mod
1	-20
2	-9
3	-6
4	-3
5	-1
6	0
7	2

Ballistic Data		10	20	40	70	100
(1)	RID	322	315	69		
(4)	RID	80	78	9.8		
(6)	RID	53	51	3.2		3RB
	DC	2	2	5		
(10)	RID	8.0	7.5			
(18)	RID	4.3	4.0			
	DC	5	5			
	3RB	-10	-5	0		
	MA	.2	.2	.3		
	BA	70	65	60		

Optional Data	
RC	1
BRC	1
WS	2.0
WC	-2
R	1
IDb	(10)+3

*LAR7 / Starforce

Lase Assault Rifle



Standard Starmarine weapon during the Dragoncrest & Seven World Wars. Out of production, it is still in service throughout known space.

Physical Data	
L	13/20
W	8.0
RT	3
ROF	**V
Cap	936
AW	.4
	Mag
SAB	1

Aim Time AC	Aim Time Mod
1	-21
2	-10
3	-7
4	-4
5	-2
6	0
7	2
8	3
9	4
10	5

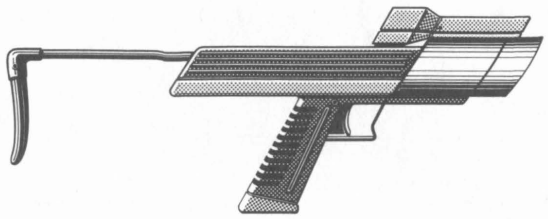
Ballistic Data		10	20	40	70	100	200	300
(1)	RID	182	178	170	158	147		
(4)	RID	45	44	41	36	31		
(6)	RID	30	29	26	22	18		3RB
(8)	RID	22	21	19	16	12		
(10)	RID	18	17	15	11	8.2		
(18)	RID	9.6	8.7	7.0	4.2	1.3		
	DC	2	2	2	2	2		
	3RB	-14	-9	-4	0	3		
	MA	.2	.2	.3	.5	.8		
	BA	69	64	59	55	52		

Optional Data	
RC	1
BRC	1
WS	1.9
WC	-1
R	1+
IDb	(10)+4
IDc	(4)
IDs	(6)+2

Starguild Weapons

*LAR8 / Starforce

Lase Assault Rifle

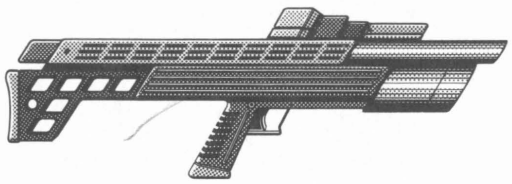


Standard Starforce lase rifle. Updated version of the LAR7, this is the standard weapon of Starmarine forces. Compact, lightweight, and efficient design.

Physical Data		Aim Time AC	Aim Time Mod	Ballistic Data: Target Range In 2 Yard hexes	10	20	40	70	100	200	300	400	600	Optional Data	
L	13/20	1	-21	(1) RID	182	178	170	158	147					RC	1
W	7.5	2	-10	(4) RID	45	44	41	36	31					BRC	1
		3	-7	(6) RID	30	29	26	22	18		3RB				
RT	3	4	-4	(8) RID	22	21	19	16	12						
ROF	**V	5	-2	(10) RID	18	17	15	11	8.2						
		6	0	(18) RID	9.6	8.7	7.0	4.2	1.3						
		7	2											WS	1.9
Cap	1050	8	3	DC	2	2	2	2	2					WC	-1
AW	.4	9	4											R	1+
	Mag	10	5	3RB	-14	-9	-4	0	3						
				MA	.2	.2	.3	.5	.8					IDb	(10)+4
				BA	70	65	60	56	54					IDc	(4)
SAB	1													IDs	(6)+1

*LARGL8 / Starforce

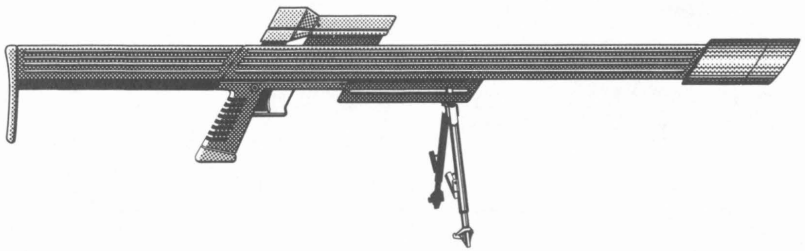
Lase Assault Rifle
30mm Grenade Launchr



Popular Starforce squad support weapon combining a LAR8 with a 30mm grenade launcher. Popular with MCPA units. See explosive weapons for grenade data.

Physical Data		Aim Time AC	Aim Time Mod	Ballistic Data: Target Range In 2 Yard hexes	10	20	40	70	100	200	300	400	600	Optional Data	
L	25	1	-24	(1) RID	182	178	170	158	147					RC	1
W	13.1	2	-13	(4) RID	45	44	41	36	31					BRC	1
		3	-8	(6) RID	30	29	26	22	18		3RB				
RT	3	4	-5	(8) RID	22	21	19	16	12						
ROF	**V	5	-2	(10) RID	18	17	15	11	8.2						
		6	-1	(18) RID	9.6	8.7	7.0	4.2	1.3						
		7	1											WS	1.7
Cap	1050	8	2	DC	2	2	2	2	2					WC	-2
AW	.4	9	4											R	2
	Mag	10	5	3RB	-14	-9	-4	0	3						
				MA	.2	.2	.3	.5	.8					IDb	(12)+5
				BA	70	65	60	56	54					IDc	(6)+2
SAB	1													IDs	(6)+3

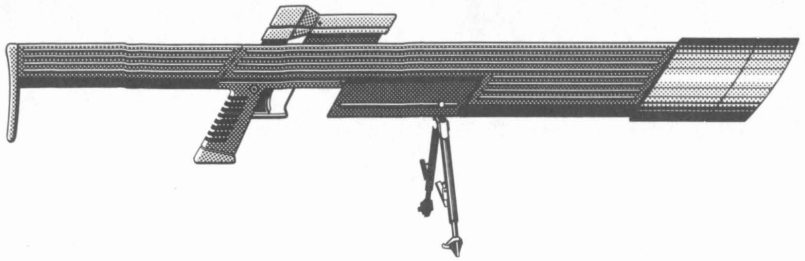
*LMG8L / Light Lase Machine Gun / Starforce



Standard Starforce light lase machine gun issued at squad level.

Physical Data		Aim Time AC	Aim Time Mod	Ballistic Data: Target Range In 2 Yard hexes	10	20	40	70	100	200	300	400	600	Optional Data	
L	42	1	-23	(1) RID	757	742	712	670	632	102				RC	1
W	12.0	2	-12	(4) RID	189	184	176	164	152					BRC	1
		3	-8	(6) RID	126	123	117	108	99			3RB			
RT	4	4	-5	(8) RID	94	92	87	80	73						
ROF	**V	5	-2	(10) RID	75	73	69	63	57						
		6	-1	(18) RID	41	40	37	33	28						
		7	1											WS	1.7
Cap	221	8	2	DC	2	2	2	2	2	6				WC	-2
AW	.4	9	4											R	2+
	Mag	10	5	3RB	-14	-9	-4	0	3	8					
				MA	.2	.2	.3	.5	.8	2				IDb	(12)+4
				BA	70	65	60	56	54	49				IDc	(6)+3
SAB	1													IDs	(6)+3

*LMG8H / Heavy Lase Machine Gun / Starforce



Standard Starforce heavy lase machine gun.

Physical Data		Aim Time AC	Aim Time Mod	Ballistic Data: Target Range In 2 Yard hexes	10	20	40	70	100	200	300	400	600	Optional Data	
L	42	1	-26	(1) RID	966	946	909	856	808	667	246			RC	1
W	18.8	2	-15	(4) RID	241	236	225	210	196	154	18			BRC	1
		3	-9	(6) RID	160	157	149	139	129	97		3RB			
RT	4	4	-5	(8) RID	120	117	111	103	95	68					
ROF	**V	5	-3	(10) RID	96	94	89	81	74	51					
		6	-2	(18) RID	53	51	48	43	38	21					
		7	1											WS	1.6
Cap	170	8	2	DC	2	2	2	2	2	2	4			WC	-3
AW	.4	9	3											R	2+
	Mag	10	4	3RB	-14	-9	-4	0	3	8	11				
		11	6	MA	.2	.2	.3	.5	.8	2	2			IDb	(14)+6
		12	7	BA	70	65	60	56	54	49	46			IDc	(10)+4
SAB	1													IDs	(8)+3

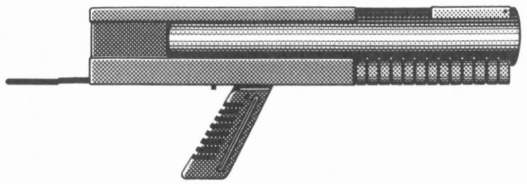
Non-Starguild Weapons

*7SL8 / Seven Sword

Lase Cannon

Backpack W = 57
PF = 100

Weapon W = 27
PF = 100



Battlepack lase cannon with multiple power settings.

Physical Data		Aim Time AC	Aim Time Mod
L	23/27	1	-28
W	84	2	-17
		3	-11
RT	3	4	-6
ROF	**V	5	-3
		6	-2
		7	0
Cap	2250	8	1
AW	15.0	9	3
	Pck	10	4
		11	6
SAB	1		

Ballistic Data — Target Range In 2 Yard hexes

		10	20	40	70	100	200	300	400	600
(1)	RID	18H	17H	17H	16H	15H	313			
(4)	RID	440	431	413	388	364	35			
(6)	RID	293	287	274	257	240	3.8		3RB	
(8)	RID	220	215	205	192	179				
(10)	RID	176	172	164	152	141				
(18)	RID	97	95	90	82	75				
	DC	2	2	2	2	2	6			
	3RB	-14	-9	-4	0	3	8			
	MA	.2	.2	.3	.5	.8	2			
	BA	70	65	60	56	54	49			

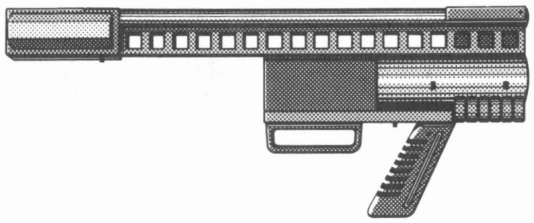
Optional Data	
RC	1
BRC	1

*7SLR8 / Seven Sword

Lase & Rocket Rifle

Backpack W = 56
PF = 100

Weapon W = 28
PF = 100



Twin Battlepack with lase cannon and 15mm rocket rifle.

Physical Data		Aim Time AC	Aim Time Mod
L	28	1	-29
W	84	2	-18
		3	-11
RT	3	4	-6
ROF	**V	5	-3
		6	-2
		7	0
Cap	2440	8	1
AW	5.0	9	3
	Pck	10	4
		11	6
SAB	1		

Ballistic Data — Target Range In 2 Yard hexes

		10	20	40	70	100	200	300	400	600
(1)	RID	734	719	690	649	612	97			
(4)	RID	183	179	171	159	147				
(6)	RID	122	119	113	104	96			3RB	
(8)	RID	91	89	84	77	70				
(10)	RID	73	71	67	61	55				
(18)	RID	40	39	36	32	27				
	DC	2	2	2	2	2	6			
	3RB	-14	-9	-4	0	3	8			
	MA	.2	.2	.3	.5	.8	2			
	BA	70	65	60	56	54	49			

Optional Data	
RC	1
BRC	1

*7SFP-AP / Flechette Pistol Aux Pack / Seven Sword

Total System PF = Variable with Power Armor Class
Weapon PF = 8

This Flechette Pistol/Armor Panel may be mounted to the outer forearm of Seven Sword Power Armor. This Auxiliary Pack takes the place of the normal armor panel and arms the user with a quick action pistol. It is normally mounted on the users off-hand and must be manually reloaded. Its magazine is specific to Seven Sword Power Armor. The system includes its own gun camera. The weight given is the weight added over that of the standard armor panel mounted in that location.

Physical Data		Aim Time AC	Aim Time Mod
L	10	1	-18
W	4.2	2	-10
		3	-8
RT	15	4	-6
ROF	**8	5	-4
		6	-3
Cap	36		
AW	.71		
	Mag		
SAB	1		

Ballistic Data — Target Range In 2 Yard hexes

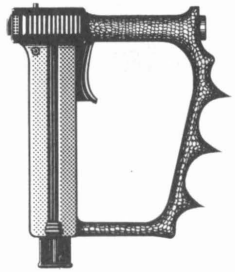
		10	20	40	70	100	200	300	400	600
FMJ	RID	40	38	34	28	24	14	7.6	4.3	1.4
	DC	5	5	4	4	3	3	2	1	1
JHP	RID	39	36	32	27	23	13	7.3	4.1	1.3
	DC	7	7	6	6	6	4	3	2	1
AP	RID	113	107	95	80	68	38	21	12	3.8
	DC	4	4	4	4	3	2	2	1	1
	3RB	-4	1	6	10	13	17	20	22	25
	MA	.2	.2	.3	.7	1	2	3	4	6
	BA	32	25	18	11	7	-2	-8	-11	-16
	TOF	0	0	1	1	1	3	6	8	13

Optional Data	
RC	1
BRC	8
CJT	1
%CJ	90

X7MP1 / Spectral

7.3mm Sub-Machinegun

Compact sub-machinegun dispersed by Spectral forces on Rhand. It will kill unarmored targets but cannot harm Spectral Warriors. This weapon has a low muzzle velocity and limited penetration.



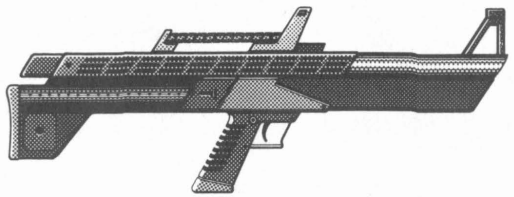
Physical Data		Aim Time AC	Aim Time Mod
L	5	1	-18
W	1.8	2	-11
		3	-10
RT	4	4	-9
ROF	*10		
Cap	60		
AW	.52		
	Mag		
SAB	2		

Ballistic Data — Target Range In 2 Yard hexes

		10	20	40	70	100	200	300	400	600
Exp	RID	2.0	1.9	1.6	1.2	.9				
	DC	3	3	2	2	1				
	MA	.2	.4	.9	2	2				
	BA	49	43	35	28	23				
	TOF	0	1	2	3	5				

Optional Data	
RC	2
BRC	*2
CJT	4
%CJ	90
WS	2.5
WC	0
R	1
IDb	(6)+2

SMPGL8 / SMP - 30mm Grenade Launcher



Landcaste slivergun & 30mm grenade launcher.

Physical Data		Aim Time AC	Aim Time Mod
L	25	1	-24
W	10.4	2	-14
RT	8	3	-9
ROF	*	4	-7
		5	-6
Cap	5	6	-4
AW	2.3		
	Mag		
SAB	8		
RC	1		
CJT	8		
%CJ	90		

Ballistic Data — Range 2 Yard hexes

		40	100	200	400	600
HEAT	RID	16H	16H	16H		
	DC	10	10	10		
HE	RID	5.1	5.1	5.1		
	DC	10	10	10		
	AOI			1	4	
	BA	27	15	5		
	TOF	11	31	75		

Shrapnel Data — Target Range From Burst in 2 Yard hexes

	C	0	1	2	3	4	5	6	8	12	20
RID	16H	4.6	4.3	3.7	3.1	2.7	2.3	2.0	1.5		
DC	10	1	1	1	1	1	1	1	1		
BSHC	*78	*1	26	6	2	1	0	-1	-3		
BC	33H	280	82	26	13	8	6	4	3	1	1
RID	5.1	4.7	4.3	3.7	3.2	2.7	2.3	2.0	1.5		
DC	10	1	1	1	1	1	1	1	1		
BSHC	*2H	*3	73	17	7	4	2	1	0		
BC	33H	280	82	26	13	8	6	4	3	1	1

*LARGL8 / LAR - 30mm Grenade Launcher

Starforce laserifle & 30mm grenade launcher.

Physical Data		Aim Time AC	Aim Time Mod
L	25	1	-24
W	13.1	2	-13
RT	8	3	-8
ROF	*	4	-5
		5	-2
Cap	5	6	-1
AW	2.3	7	1
	Mag	8	2
		9	4
SAB	7	10	5
RC	1		
CJT	8		
%CJ	90		

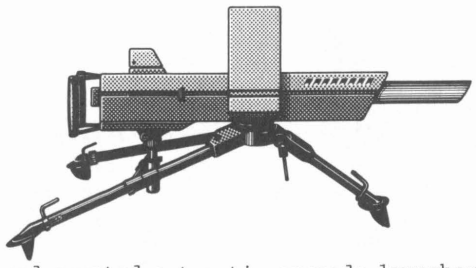
Ballistic Data — Range 2 Yard hexes

		40	100	200	400	600
HEAT	RID	16H	16H	16H		
	DC	10	10	10		
HE	RID	5.1	5.1	5.1		
	DC	10	10	10		
	AOI			1	4	
	BA	27	15	5		
	TOF	11	31	75		

Shrapnel Data — Target Range From Burst in 2 Yard hexes

	C	0	1	2	3	4	5	6	8	12	20
RID	16H	4.6	4.3	3.7	3.1	2.7	2.3	2.0	1.5		
DC	10	1	1	1	1	1	1	1	1		
BSHC	*78	*1	26	6	2	1	0	-1	-3		
BC	33H	280	82	26	13	8	6	4	3	1	1
RID	5.1	4.7	4.3	3.7	3.2	2.7	2.3	2.0	1.5		
DC	10	1	1	1	1	1	1	1	1		
BSHC	*2H	*3	73	17	7	4	2	1	0		
BC	33H	280	82	26	13	8	6	4	3	1	1

*GLB8A / 30mm Grenade Battery / Starforce



Tripod mounted automatic grenade launcher.

Physical Data		Aim Time AC	Aim Time Mod
L	32	1	-32
W	49.7	2	-21
RT	10	3	-16
ROF	*4	4	-9
		5	-5
Cap	54	6	-3
AW	25.0	7	-1
	Mag	8	0
SAB	2	9	2
RC	1	10	3
BRC	4	11	5
CJT	6	12	6
%CJ	80		

Ballistic Data — Range 2 Yard hexes

		40	100	200	400	600
HEAT	RID	16H	16H	16H		
	DC	10	10	10		
HE	RID	5.1	5.1	5.1		
	DC	10	10	10		
	AOI			1	4	
	MA	.6	2	3		
	BA	27	15	5		
	TOF	11	31	75		

Shrapnel Data — Target Range From Burst in 2 Yard hexes

	C	0	1	2	3	4	5	6	8	12	20
RID	16H	4.6	4.3	3.7	3.1	2.7	2.3	2.0	1.5		
DC	10	1	1	1	1	1	1	1	1		
BSHC	*78	*1	26	6	2	1	0	-1	-3		
BC	33H	280	82	26	13	8	6	4	3	1	1
RID	5.1	4.7	4.3	3.7	3.2	2.7	2.3	2.0	1.5		
DC	10	1	1	1	1	1	1	1	1		
BSHC	*2H	*3	73	17	7	4	2	1	0		
BC	33H	280	82	26	13	8	6	4	3	1	1

*RL8A / 70mm Rocket Launcher / Starforce

Shoulder mounted anti-tank rocket launcher.

Physical Data		Aim Time AC	Aim Time Mod
L	42	1	-22
W	9.3	2	-10
		3	-7
RT	22	4	-4
		5	-2
		6	-1
Cap	1	7	1
AW	3.1	8	2
	Rnd	9	4
		10	5
RC	1	11	7
CJT	22		
%CJ	90		

Ballistic Data — Range 2 Yard hexes

		40	100	200	400	600
HEAT	RID	51H	51H	51H	51H	51H
	DC	10	10	10	10	10
HE	RID	15	15	15	15	15
	DC	10	10	10	10	10
	BA	24	12	2	-7	-13
	TOF	2	6	14	31	52

Shrapnel Data — Target Range From Burst in 2 Yard hexes

	C	0	1	2	3	4	5	6	8	12	20
RID	51H	4.7	4.3	3.7	3.2	2.7	2.3	2.0	1.5		
DC	10	1	1	1	1	1	1	1	1		
BSHC	*3H	*4	88	21	9	5	3	1	0		
BC	57K	20H	390	104	52	32	22	16	10	5	2
RID	15	4.7	4.3	3.7	3.2	2.7	2.3	2.0	1.5		
DC	10	1	1	1	1	1	1	1	1		
BSHC	*2K	*27	*7	*2	73	41	26	17	9		
BC	72K	24H	448	116	57	35	24	18	11	6	3

Explosive Weapons

*RPG8A / 80mm RPG / Starforce

Rocket Propelled Grenade Launcher.

Physical Data		Aim Time AC	Aim Time Mod
L	42	1	-22
W	9.6	2	-10
		3	-7
RT	20	4	-4
		5	-2
		6	-1
Cap	1	7	1
AW	3.4	8	2
	Rnd	9	4
		10	5
RC	1		
CJT	20		
%CJ	90		

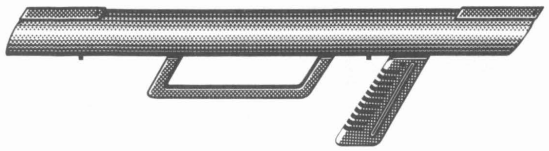
Ballistic Data — Range 2 Yard hexes

		40	100	200	400	600
HEAT	RID	62H	62H	62H	62H	62H
	DC	10	10	10	10	10
HE	RID	14	13	11	8.4	7.4
	DC	10	10	10	10	10
	BA	23	11	1	-8	-14
	TOF	2	7	14	33	54

Shrapnel Data — Target Range From Burst in 2 Yard hexes

	C	0	1	2	3	4	5	6	8	12	20
RID	62H	16	16	15	14	13	13	12	11	8.9	5.8
DC	10	9	9	9	9	9	9	9	8	8	7
BSHC	*6	7	1	-2	-5	-7	-9	-10	-12	-15	-19
BC	88K	28H	508	129	63	39	27	20	12	6	3
RID	V	4.7	4.3	3.7	3.2	2.7	2.3	2.0	1.5		
DC	10	1	1	1	1	1	1	1	1		
BSHC	*2K	*27	*7	*2	73	41	26	17	9		
BC	12T	37H	622	151	73	45	31	23	14	7	3

*BP-GL / 30mm Grenade Battlepack / Starforce



Backpack W = 76 Cap = 164 PF = 21

Weapon W = 14 PF = 21

Physical Data		Aim Time AC	Aim Time Mod
L	28	1	-24
W	90	2	-13
RT	10	3	-8
ROF	*	4	-5
		5	-2
Cap	5	6	-1
AW	.25	7	1
	Rnd	8	2
		9	4
SAB	2	10	5
RC	1		
CJT	10		
%CJ	90		

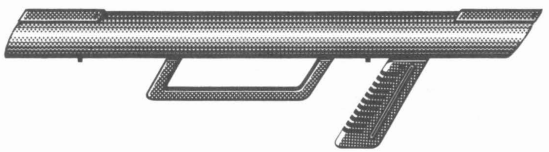
Ballistic Data — Range 2 Yard hexes

		40	100	200	400	600
HEAT	RID	16H	16H	16H	16H	16H
	DC	10	10	10	10	10
HE	RID	6.4	5.8	5.3	5.3	5.3
	DC	10	10	10	10	10
	AOI				1	2
	BA	31	18	8	-1	-5
	TOF	3	9	22	52	87

Shrapnel Data — Target Range From Burst in 2 Yard hexes

	C	0	1	2	3	4	5	6	8	12	20
RID	16H	4.6	4.3	3.7	3.1	2.7	2.3	2.0	1.5		
DC	10	1	1	1	1	1	1	1	1		
BSHC	*78	*1	26	6	2	1	0	-1	-3		
BC	33H	280	82	26	13	8	6	4	3	1	1
RID	V	4.7	4.3	3.7	3.2	2.7	2.3	2.0	1.5		
DC	10	1	1	1	1	1	1	1	1		
BSHC	*2H	*3	73	17	7	4	2	1	0		
BC	33H	280	82	26	13	8	6	4	3	1	1

*BP-RR / 45mm Rocket Rifle BP / Starforce



Backpack W = 78 Cap = 29 PF = 21

Weapon W = 15 PF = 21

Physical Data		Aim Time AC	Aim Time Mod
L	28	1	-25
W	93	2	-14
		3	-8
RT	8	4	-5
		5	-3
		6	-1
Cap	1	7	1
AW	1.2	8	2
	Rnd	9	4
		10	5
RC	1	11	6
CJT	8	12	7
%CJ	90		

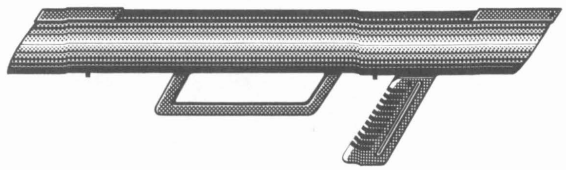
Ballistic Data — Range 2 Yard hexes

		40	100	200	400	600
HEAT	RID	28H	28H	28H	28H	28H
	DC	10	10	10	10	10
HE	RID	11	11	11	11	11
	DC	10	10	10	10	10
	BA	25	13	3	-6	-12
	TOF	1	3	5	12	20

Shrapnel Data — Target Range From Burst in 2 Yard hexes

	C	0	1	2	3	4	5	6	8	12	20
RID	28H	4.7	4.3	3.7	3.2	2.7	2.3	2.0	1.5		
DC	10	1	1	1	1	1	1	1	1		
BSHC	*2H	*3	62	15	6	3	2	1	0		
BC	13K	696	174	52	26	16	11	9	5	3	1
RID	11	4.7	4.3	3.7	3.2	2.7	2.3	2.0	1.5		
DC	10	1	1	1	1	1	1	1	1		
BSHC	*6H	*9	*2	54	24	13	8	5	2		
BC	16K	788	192	57	29	18	12	9	6	3	1

*BP-RL / 70mm Rocket Launcher BP / Starforce



Backpack W = 88 Cap = 10 PF = 21

Weapon W = 22 PF = 21

Physical Data		Aim Time AC	Aim Time Mod
L	28	1	-27
W	100	2	-16
		3	-9
RT	10	4	-6
		5	-3
		6	-2
Cap	1	7	0
AW	3.1	8	1
	Rnd	9	3
		10	4
RC	1	11	6
CJT	10	12	7
%CJ	90		

Ballistic Data — Range 2 Yard hexes

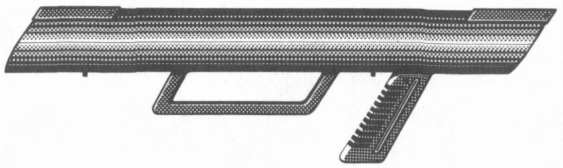
		40	100	200	400	600
HEAT	RID	51H	51H	51H	51H	51H
	DC	10	10	10	10	10
HE	RID	15	15	15	15	15
	DC	10	10	10	10	10
	BA	24	12	2	-7	-13
	TOF	2	6	14	31	52

Shrapnel Data — Target Range From Burst in 2 Yard hexes

	C	0	1	2	3	4	5	6	8	12	20
RID	51H	4.7	4.3	3.7	3.2	2.7	2.3	2.0	1.5		
DC	10	1	1	1	1	1	1	1	1		
BSHC	*3H	*4	88	21	9	5	3	1	0		
BC	57K	20H	390	104	52	32	22	16	10	5	2
RID	15	4.7	4.3	3.7	3.2	2.7	2.3	2.0	1.5		
DC	10	1	1	1	1	1	1	1	1		
BSHC	*2K	*27	*7	*2	73	41	26	17	9		
BC	72K	24H	448	116	57	35	24	18	11	6	3

Explosive Weapons

*BP-RPG / 80mm RPG Battlepack / Starforce



Backpack W = 76 Cap = 8 PF = 21

Weapon W = 23 PF = 21

Physical Data		Aim Time AC	Aim Time Mod
L	28	1	-27
W	99	2	-16
		3	-9
RT	10	4	-6
		5	-3
		6	-2
Cap	1	7	1
AW	3.4	8	2
	Rnd	9	4
		10	5
RC	1		
CJT	10		
%CJ	90		

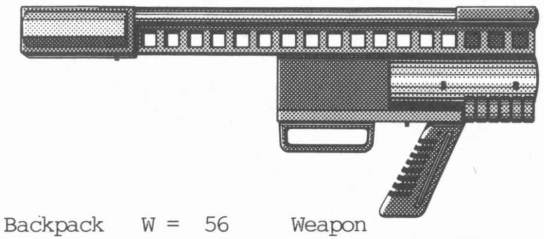
Ballistic Data — Range 2 Yard hexes

		40	100	200	400	600
HEAT	RID	62H	62H	62H	62H	62H
	DC	10	10	10	10	10
HE	RID	14	13	11	8.4	7.4
	DC	10	10	10	10	10
	BA	23	11	1	-8	-14
	TOF	2	7	14	33	54

Shrapnel Data — Target Range From Burst in 2 Yard hexes

	C	0	1	2	3	4	5	6	8	12	20
RID	62H	16	16	15	14	13	13	12	11	8.9	5.8
DC	10	9	9	9	9	9	9	9	8	8	7
BSHC	*6	7	1	-2	-5	-7	-9	-10	-12	-15	-19
BC	88K	28H	508	129	63	39	27	20	12	6	3
RID	V	4.7	4.3	3.7	3.2	2.7	2.3	2.0	1.5		
DC	10	1	1	1	1	1	1	1	1		
BSHC	*2K	*27	*7	*2	73	41	26	17	9		
BC	12T	37H	622	151	73	45	31	23	14	7	3

*7SLR8 / 15mm Rocket Rifle BP / Seven Sword



Backpack W = 56 Cap = 46 PF = 100

Weapon W = 28 PF = 100

Physical Data		Aim Time AC	Aim Time Mod
L	28	1	-29
W	84	2	-18
RT	8	3	-11
ROF	*	4	-6
		5	-3
Cap	5	6	-2
AW	.17	7	0
	Rnd	8	1
		9	3
SAB	1	10	4
RC	1	11	6
CJT	1		
%CJ	90		

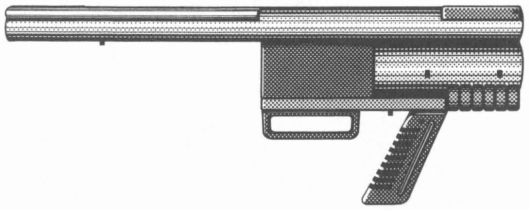
Ballistic Data — Range 2 Yard hexes

		40	100	200	400	600
HEAT	RID	148	148	148	148	148
	DC	10	10	10	10	10
HE	RID	3.7	3.7	3.7	3.7	3.7
	DC	10	10	10	10	10
	BA	35	26	18	10	5
	TOF	1	3	5	12	19

Shrapnel Data — Target Range From Burst in 2 Yard hexes

	C	0	1	2	3	4	5	6	8	12	20
RID	148	.8	.7	.4							
DC	10	1	1	1							
BSHC	*13	18	4	0							
BC	521	74	24	8	4	2	2	1	1		
RID	3.7	1.3	1.1	.8	.5	.4					
DC	10	1	1	1	1	1					
BSHC	*13	18	4	0	-2	-4					
BC	808	105	33	11	6	3	2	2	1	1	

*7SLG8 / 30mm Grenade BP / Seven Sword



Backpack W = 56 Cap = 30 PF = 100

Weapon W = 29 PF = 100

Physical Data		Aim Time AC	Aim Time Mod
L	28	1	-29
W	85	2	-18
RT	8	3	-11
ROF	*	4	-6
		5	-3
Cap	5	6	-2
AW	.25	7	0
	Rnd	8	1
		9	3
SAB	1	10	4
RC	1	11	6
CJT	10		
%CJ	90		

Ballistic Data — Range 2 Yard hexes

		40	100	200	400	600
HEAT	RID	16H	16H	16H	16H	16H
	DC	10	10	10	10	10
HE	RID	6.4	5.8	5.3	5.3	5.3
	DC	10	10	10	10	10
	AOI				1	2
	BA	31	18	8	-1	-5
	TOF	3	9	22	52	87

Shrapnel Data — Target Range From Burst in 2 Yard hexes

	C	0	1	2	3	4	5	6	8	12	20
RID	16H	4.6	4.3	3.7	3.1	2.7	2.3	2.0	1.5		
DC	10	1	1	1	1	1	1	1	1		
BSHC	*78	*1	26	6	2	1	0	-1	-3		
BC	33H	280	82	26	13	8	6	4	3	1	1
RID	V	4.7	4.3	3.7	3.2	2.7	2.3	2.0	1.5		
DC	10	1	1	1	1	1	1	1	1		
BSHC	*2H	*3	73	17	7	4	2	1	0		
BC	33H	280	82	26	13	8	6	4	3	1	1

*7SGP-AP / 30mm Grenade AP / Seven Sword

Total System PF = Variable with Suit
Weapon PF = 8

This 30mm Grenade Launcher is mounted in the outer forearm armor panel of Seven Sword Power Armor. It fires standard low velocity 30mm grenades and must be manually reloaded. The unit has its own gun camera. The weight entry gives the additional weight associated with adding this system to the suit's normal armor panel.

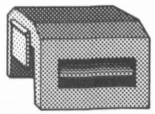
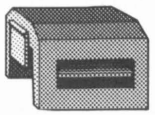
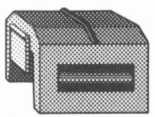
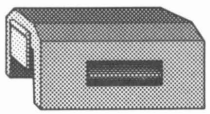
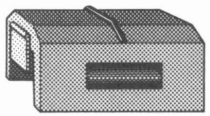
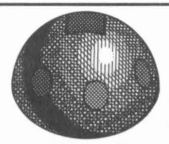
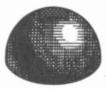
Physical Data		Aim Time AC	Aim Time Mod
L	10	1	-18
W	4.5	2	-10
RT	10	3	-8
ROF	*	4	-6
		5	-4
Cap	2	6	-3
AW	.6		
	Mag		
SAB	2		
RC	1		
CJT	4		
%CJ	90		

Ballistic Data — Range 2 Yard hexes

		40	100
HEAT	RID	16H	16H
	DC	10	10
HE	RID	5.1	5.1
	DC	10	10
	AOI		1
	BA	25	13
	TOF	15	42

Shrapnel Data — Target Range From Burst in 2 Yard hexes

	C	0	1	2	3	4	5	6	8	12	20
RID	16H	4.6	4.3	3.7	3.1	2.7	2.3	2.0	1.5		
DC	10	1	1	1	1	1	1	1	1		
BSHC	*78	*1	26	6	2	1	0	-1	-3		
BC	33H	280	82	26	13	8	6	4	3	1	1
RID	5.1	4.7	4.3	3.7	3.2	2.7	2.3	2.0	1.5		
DC	10	1	1	1	1	1	1	1	1		
BSHC	*2H	*3	73	17	7	4	2	1	0		
BC	33H	280	82	26	13	8	6	4	3	1	1

Grenades/Explosives		Physical Data		Shrapnel Data	Target Range From Burst In 2 Yard hexes																										
					C	0	1	2	3	4	5	6	7	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38
G-F8A Light Starfleet Grenade		Length	1.5	RID	1.9	1.7	1.5																								
		Weight	.3	DC	10	1	1																								
		Arm Time	4	BSHC	*2H	*3	73																								
		Fuse	I	BC	386	58	18	6	3	2	1	1	1	1																	
		Range	30																												
G-F8B Light Frag Grenade		Length	1.5	RID	4.8	4.6	4.2	3.6	3.1	2.7	2.3	2.0	1.7	1.4																	
		Weight	.4	DC	10	1	1	1	1	1	1	1	1	1																	
		Arm Time	4	BSHC	*2H	*3	73	17	7	4	2	1	1	0																	
		Fuse	I	BC	14H	155	48	15	8	5	3	3	2	2	1	1	1	1													
		Range	25																												
G-B8B Light Blast Grenade		Length	1.5	RID	1.6																										
		Weight	.3	DC	10																										
		Arm Time	4																												
		Fuse	I	BC	16H	173	53	17	9	5	4	3	2	2	1	1	1	1													
		Range	28																												
G-F8C Heavy Frag Grenade		Length	2.5	RID	4.9	4.7	4.3	3.7	3.2	2.7	2.3	2.0	1.7	1.5	1.1																
		Weight	.6	DC	10	1	1	1	1	1	1	1	1	1	1																
		Arm Time	4	BSHC	*6H	*9	*2	54	24	13	8	5	4	2	1																
		Fuse	I	BC	61H	417	115	35	18	11	8	6	5	4	3	2	1	1	1	1	1	1	1	1							
		Range	19																												
G-B8C Heavy Blast Grenade		Length	2.5	RID	2.9																										
		Weight	.4	DC	10																										
		Arm Time	4																												
		Fuse	I	BC	83H	513	136	42	21	13	9	7	5	4	3	2	2	1	1	1	1	1	1	1	1	1					
		Range	23																												
MGL-G8A Multiple Grenade Launcher		Length	10/15	RID	4.8	4.6	4.2	3.6	3.1	2.7	2.3	2.0	1.7	1.4																	
		Weight	2.8	DC	10	1	1	1	1	1	1	1	1	1																	
		Arm Time	12	BSHC	*1H	*1	35	8	3	1	0	0	-1	-2																	
		Fuse	I	BC	14H	155	48	15	8	5	3	3	2	2	1	1	1	1													
		Range	70																												
M-CBU8B Light Cluster Mine		Length	7.0	RID	4.8	4.6	4.2	3.6	3.1	2.7	2.3	2.0	1.7	1.4																	
		Weight	4.5	DC	10	1	1	1	1	1	1	1	1	1																	
		Arm Time	8	BSHC	*2H	*3	73	17	7	4	2	1	1	0																	
		Fuse	V	BC	14H	155	48	15	8	5	3	3	2	2	1	1	1	1													
		Range	5																												
M-CBU8C Heavy Cluster Mine		Length	9.5	RID	4.9	4.7	4.3	3.7	3.2	2.7	2.3	2.0	1.7	1.5	1.1																
		Weight	6.0	DC	10	1	1	1	1	1	1	1	1	1	1																
		Arm Time	8	BSHC	*6H	*9	*2	54	24	13	8	5	4	2	1																
		Fuse	V	BC	61H	417	115	35	18	11	8	6	5	4	3	2	1	1	1	1	1	1	1	1							
		Range	4																												
M-F8B Flechette Mine		Length	7.0	RID	112	112	112	111	110	110	109	108	107	107	105	104	103	101	100	99	97	96	95	94	92	91	90	89	88		
		Weight	13.6	DC	10	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5		
		Arm Time	8	BSHC	*90	*1	31	7	3	1	0	0	-2	-3	-4	-5	-7	-7	-8	-9	-10	-10	-11	-11	-12	-12	-13	-13	-14		
		Fuse	V																												
		Range	4																												

PHOENIX COMMAND™

High-Tech Weapon Data Supplement

Phoenix Command Fights For the Future

This supplement to the **Phoenix Command Small Arms Combat System** sets the scene for High-Tech combat, and contains over 50 weapons suitable for futuristic battles. Included are:

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The Revolution in Game Design continues!

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WEAPON DESIGN

Using the rules in this section, players can convert real-world weapons to Phoenix Command Small Arms Combat System game statistics, and use them in the game. The formulas aren't perfect, but they come reasonably close to the values in the books — in most cases you can't duplicate a PCSACS weapon exactly but can approach it close enough. When in doubt, compare the calculated stats with those of a similar weapon and adjust them as seems most appropriate.

Since these formulas use the metric system, conversion from Imperial measures to metric is necessary for those using Imperial measures. Likewise, weapon stats are measured in the Imperial system in PCSACS, so conversion from metric is necessary in many cases.

From	To	Multiply by
foot-pounds	joules	1.356
grains	grams	0.06480
grams	grains	15.43
grams	pounds	2,205
inches	centimeters	2.540
inches	millimeters	25.40
kilograms	pounds	2.205
meters	yards	1.094
pounds	grams	453.6
pounds	kilograms	0.4536
yards	meters	0.9144

BEFORE WE BEGIN…

…some background notes and information about both these weapon design guidelines and what I learned about the Phoenix Command system by creating them.

Most importantly, perhaps, is to note that Phoenix Command is a formulaic system. It appears (pretends?) to be based on actual weapon capabilties, but to a fairly large degree its values seem to have been created by plugging research data into formulas, and then fudged around a bit to create the numbers that formulas can't come up with easily. There is also the rumor that Leading Edge Games deliberately altered some numbers to prevent attempts at reverse-engineering, but I don't know if that's true. All I can say is that most of the important stats weren't too hard to create formulas for by simply typing as many values as practical into a maths program that does regression (calculating a formula from a set of values for *x* and *y*).

What this means for you, the ~~rabid~~ avid PCCS gamer who wants to expand the choice of weapons in the game, is that you shouldn't expect these guidelines to give you a perfect translation of the real thing into game stats. You *will* need to refer to the existing game stats of similar weapons and at times simply make up numbers so they look right.

By the same token, don't be afraid to deviate from the existing numbers — exactly because they are often formula-based, they don't

always reflect real weapons' strengths and weaknesses. You will need to do just that if you want to be accurate, though.

FIREARMS

Weapon Design Made Easy

These pages include an on-line weapon designer which calculates the outcome of all the formulas in this section for you.

These will be the most common weapons players will want to design. For the most part, firearms design has been fully reverse-engineered, but there are still some areas that could not be deciphered.

Length (L)

The weapon's length in inches, rounded to the nearest whole inch. For folding-stock weapons, do this for both folded and unfolded stocks.

Weight (W)

The mass of the loaded weapon in pounds, rounded to the nearest 0.1 of a pound.

Reload Time (RT)

Depends on the magazine type. The following figures are suggestions, based on weapons in the PCSACS rulebook.

Belt: most often 12; if the belt is held in a drum or other carrier, RT is usually 14

Charging Strip: 8

Detachable Box Magazine: 7 to 10, though usually 8

Internal Magazine: 4.25 × number of rounds that can be held in the weapon (round up)

Loose Rounds: 10 × number of rounds that can be held in the weapon, but often longer

Rate Of Fire (ROF)

The mechanism used by the weapon is the determining factor here:

Automatic: divide the real-world rate of fire in rounds per minute by 120 and round up to find the ROF in rounds per half-second burst; add a * before the ROF to denote autofire

Bolt Action: 3

Burst-Capable: same as for an automatic weapon, but add ** before the ROF (for a weapon that can only fire bursts, not full-automatic, it may be a good idea to give the ROF as only **)

Double-Action Revolver: 1

Lever Action: 2

Semi-Automatic/Self-Loading: indicate this by a single *

Single-Action Revolver: 2

Single Shot Weapon: —

Ammunition Capacity (Cap)

The magazine size in rounds. If more than one magazine size is available, list the most common. For belts, indicate a common belt length — usually 100 rounds for disintegrating-link belts, or the actual belt length for continuous belts.

Ammunition Weight (AW)

For weapons fed from a belt or detachable box magazine, this is its weight in pounds, rounded off to the nearest .1 pounds. The magazine type is Magazine (Mag), Drum (Drm), or Belt (Blt), depending on the exact type of magazine.

For weapons with internal magazines, this indicates the mass of a single round in pounds, rounded off to the nearest .01 pounds. The magazine type is Round (Rnd).

Knockdown (KD) & Sustained Automatic Burst (SAB)

The easiest way to find figures for Knockdown and Sustained

Automatic Burst is to compare it to the values for other weapons firing similar ammunition. The table below shows KD values for various ammunition types fired from short- and long-barreled weapons. Barrel lengths are relative to the ammunition — a long barrel for a pistol round is much shorter than a long barrel for a rifle round, for example.

It is possible to calculate an approximation of the KD using the following formula:

$$KD = Bullet\ Weight \times Muzzle\ Velocity \times 0.0011$$

in which *Bullet Weight* is in grams and *Muzzle Velocity* in meters per second. Note that it seems to work better for pistol-caliber rounds than for rifle ammunition, though. (Formula by William Miller <pmiller@ipa.net>, via R.J. Andron.)

KD and SAB

These stats are some of the hardest to figure out, as they don't appear to be based on hard, real-world values. Your best bet is to copy them from a weapon of similar caliber and mass.

SAB is a base value that must be adjusted for the weapon in question, by dividing the SAB from the table by the square root of the weapon's weight in pounds. Round the result up to the nearest whole number.

The values are taken directly from a variety of Phoenix Command books; if a caliber does not have an entry for a barrel length, it is because no weapon firing the ammo from such a barrel could be found. Where known, the full metric designation of the round appears in parentheses behind the name used in Phoenix Command weapon data.

Military Calibers

Caliber	Type	Knockdown Short barrel	Knockdown Long barrel	SAB
4.7 mm Caseless (4.7×33 mm)	Rifle		4	8
5.45×39.5 mm	Rifle	3	4	8
5.56 mm NATO (5.56×45 mm)	Rifle	4	4	9
6.5 mm Carcano	Rifle	7		
6.5 mm Meiji 30	Rifle			
7.5 mm MAS (7.5×54 mm)	Rifle		9	15
7.5 mm Mle 29 (7.5×54mm)	Rifle		9	
7.62×25 mm	Pistol	3	3	5
7.62×39 mm	Rifle	7	7	
7.62 mm NATO (7.62×51 mm)	Rifle	10	10	17
7.62 mm NATO reduced load	Rifle		8	
7.62×54 mm	Rifle		12	
.30-06 (7.62×63 mm)	Rifle		11	
.30 Carbine (7.62×33 mm)	Rifle		5	
.300 Winchester Magnum (7.62×66 mm)	Rifle		13	21
7.63×25 mm	Pistol	3	3	5
7.65 mm Longue (7.65×19.5 mm)	Pistol		2	
.303 British (7.7×56 mm R)	Rifle	8	11	
7.7×58 mm	Rifle		10	
7.7 mm Shiki 99 (7.7×58 mm)	Rifle		10	
7.92 mm Kurz (7.92×33 mm)	Rifle		6	

7.92 mm Mauser (7.92×57 mm)	Rifle		10	
8 mm Mauser (7.92×57 mm)	Rifle		10	
8 mm Mle 92	Pistol	2		
8 mm Modello 35	Rifle		12	
8 mm Taisho 14	Pistol	2	3	
9×18 mm	Pistol	2		4
9 mm Glisenti (9×19 mm)	Pistol	3		
9 mm Modello 38A	Pistol		4	
9 mm Parabellum (9×19 mm)	Pistol	3	4	6
.38 British Service (9.1×19.5 mm)	Pistol	3		
.45 ACP (11.43×23 mm SR)	Pistol	5	5	8
.455 Revolver	Pistol	4		
.50 Browning (12.7×99 mm)	MG		45	
12.7×107 mm	MG		49	
14.5 mm (14.5×114 mm)	MG		70	
12 Gauge	Shot	14	25	
25 mm Cannon (25×137 mm)[1]	AC		245	
30 mm Grenade (30×28 mm)[2]	GL		26	
30 mm Grenade[3]	GL			
30 mm Cannon[4]	AC			
40 mm Grenade (40×46 mm)[5]	GL	15		
40 mm Grenade (40×53 mm)[6]	GL		51	
66 mm Lanze	RL		379	
66 mm M72A2 LAW	RL		175	
67 mm Armbrust	RL		253	
85 mm RPG-7V	RL		820	
94 mm LAW 80	RL		230	

[1] The round fired by the 25 mm cannon of the LAV25 and M2 Bradley

[2] The grenade fired by the AGS-17 *Plamya*

[3] The grenade fired by the AK 74 with grenade launcher; note that this is actually a 40 mm grenade

[4] The round fired by the 30 mm cannon of the BMP 2

[5] The grenade fired by the H&K 69A1, M79, M174, and others

[6] The grenade fired by the M19

Civilian & Police Calibers

		Knockdown		
Caliber	Type	Short barrel	Long barrel	SAB
.22 Long	Pistol/ Rifle		1	
.22 Long Rifle (5.6×16 mm)	Rifle	1	1	
.22 Winchester Magnum Rimfire	Rifle		2	
.22-250 Remington	Rifle		5	

.221 Remington "Fireball"	Rifle	3		
.222 Remington	Rifle		4	
.223 Remington (5.56×45 mm)	Rifle	4	4	
.243 Winchester	Rifle		7	
6 mm Remington	Rifle		7	
.25 Automatic	Pistol	1		
.25-06 Remington	Rifle		8	
.264 Winchester Magnum	Rifle		10	
.270 Weatherby Magnum	Rifle		10	
.270 Winchester	Rifle		10	
.280 Remington	Rifle		11	
7 mm BR Remington	Rifle	4		
7 mm Remington Magnum	Rifle		12	
7 mm Weatherby Magnum	Rifle		12	
.30-30 Winchester	Rifle		9	
.300 Holland & Holland	Rifle		12	
.300 Weatherby Magnum	Rifle		14	
.308 Winchester (7.62×51 mm)	Rifle	10	10	
.32 ACP (7.65×17 mm)	Pistol	2		3
.32 S&W Long	Pistol	1	2	
.338 Winchester Magnum (8.58×66 mm)	Rifle		15	
.338 Weatherby Magnum	Rifle		18	
.35 Remington	Rifle		9	
.375 Holland & Holland	Rifle		18	
.375 Winchester	Rifle		11	
.378 Weatherby Magnum	Rifle		21	
.380 Automatic (9×17 mm)	Pistol	2		
9 mm Winchester Magnum (9×29 mm)	Pistol	4		
.38 Special (9×29 mm R)	Pistol	3	4	
.38 Super (9×33 mm SR)	Pistol	3		
.357 Magnum (9×33 mm R)	Pistol	4	5 (6)[1]	
10 mm	Pistol	5		
.410 Gauge	Shot		4	
.41 Magnum	Pistol	7	8 (9)[1]	
.44 Automag	Pistol		8	
.44 Magnum (10.92×33 mm R)	Pistol	7	9 (11)[1]	
.44 S&W Special	Pistol		6	
.444 Marlin	Rifle		13	
.45-70 Government	Rifle		13	
.45 Winchester Magnum	Pistol	8		
.454 Casull	Pistol		12	
.458 Winchester Magnum	Rifle		25	
.460 Weatherby Magnum	Rifle		32	
20 gauge	Shot		13	
10 gauge	Shot		19	

[1] The second value (in parentheses) is when fired from a rifle-type weapon, the first value is when fired from a long-barreled pistol

Aim Time

The number of steps in the Aim Time table is based on the weapon's sight radius, i.e. the distance between the front and rear sights of the weapon.

$$Steps = Radius^{0.53} \times 1.37$$

where *Radius* is in centimeters.

For ease, you can look up the sight radius in the table below and read off the number of steps. If you can't find the exact sight radius, use the one below it. For example, a radius of 37.2 cm uses the 34.9 line, or 9 steps.

Radius (cm)	Number of steps
0.5	1
1.2	2
4.4	3
7.6	4
11.5	5
16.2	6
21.7	7
27.9	8
34.9	9
42.5	10
50.9	11
60.0	12
69.8	13
80.3	14
91.4	15

An exception is formed by weapons with optical sights. These have 11 or 12 steps, depending on the magnification power and quality of the scope. Generally, low-powered scopes (as fitted to assault rifles) have 11 steps, high-powered ones (used for sniper rifles) have 12.

Additionally, large weapons that have no shoulder stock reduce the number of steps by 1. This is basically anything larger than a pistol that is fired without the use of a stock. A good example is the Heckler & Koch MP5K submachinegun.

The modifier for an Aim Time of 1 depends on the weapon's weight. Use this formula to calculate it:

$$Md = \ln(Weight) \times 4.76 + 16.4$$

Md is the Aim Time Mod, ln is the natural logarithm, and *Weight* is the weapon's weight in kilograms. In short, take the natural logarithm from the weight (use the "ln" key on a scientific calculator), multiply the result by 4.76 and add that to 16.4.

Naturally, this is a negative modifier.

For the following Aim Time steps, comparison with a similar weapon is usually the best method of "calculation." No formula could be found that gave acceptable results and fit most weapons published for Phoenix Command. For this reason, the following table has suggested steps for a few types of weapon, which should be adjusted slightly based on how easy the weapon is to aim.

Aim Time	Modifier		
	Pistols	Rifles, SMGs	Machine guns
2	+6	+10	+10
3	+7	+14	+16
4	+8	+16	+20
5	+9	+17	+22
6	+10	+18	+24
7	+11	+19	+25
8	+12	+20	+26

Sight Radius

Weapon reference books that go into more detail than average often list the sight radius, so that's a good source of this information.

If you can't get the sight radius this way, find a good side photograph of the weapon, and measure both the total length of the weapon and the distance between the front and rear sights. Divide the measured sight radius by the measured length of the whole weapon, then multiply the outcome by the weapon's actual length.

For example, an SVD sniper rifle is 123 cm long, while in a side-on photograph it's 17.8 cm. The radius of its iron sights in the photograph is some 8.4 cm, so the actual sight radius is 8.4 ÷ 17.8 × 123 = 58.7 cm. Looking in the table, this gives the SVD 11 Aim Time steps when using iron sights.

(For those interested, the actual sight radius of an SVD is 58 cm, according to the Compendium of Modern Firearms by Kevin Dockery.)

9	+13	+21	+27
10	+14	+22	+28
11	+15	+23	+29
12	+16	+24	+30
13	+17	+25	+31
14	+18	+26	+32
15	+19	+27	+33

Penetration (PEN)

Calculate the PEN at a range of 10 hexes by using one of the two formulas below. The first is for round-nosed bullets (like those fired by pistols and submachineguns), the second is for pointed bullets (as fired by rifles and machineguns).

$$\text{Round-nosed: } PEN = (Energy \div Caliber) \times 0.0363 + 0.130$$
$$\text{Pointed: } PEN = (Energy \div Caliber) \times 0.0305 + 5.87$$

Energy is the muzzle energy in joules, while *Caliber* is the weapon's caliber in millimeters.

At ranges larger than 10 hexes, the PEN can be calculated by this formula:

$$PEN = 0.995^{Range} \times 1.03 \times Base\ PEN$$

where *Base PEN* is the PEN at a range of 10 hexes (20 yards/±18 meters), and *Range* is in hexes. You need, therefore, not stick to the ranges set out in PCSACS but can calculate PEN values for any range you want to. However, it is handier for continuity to calculate the weapon's PEN for ranges 20, 40, 70, 100, 200, 300, and 400 hexes. For these ranges, multiply the base PEN by the values from the table at right. Do this before rounding off the base PEN values.

Range	PEN Multiplier
20	0.932
40	0.843
70	0.725
100	0.624
200	0.378
300	0.229
400	0.139

For each range, if the PEN is smaller than 10, drop all fractions after the first decimal (2.4532 becomes 2.4), while if the PEN is 10 or greater, drop all fractions after the decimal point (15.7154 becomes 15).

Jacketed Hollow Point (JHP): multiply the PEN for each range by 0.95 to calculate the PEN of jacketed hollow point rounds. Again, multiply before rounding off the base PEN ratings.

Armor Piercing (AP): multiply the PEN for each range by 1.44 to calculate the PEN of armor-piercing rounds.

High Explosive Anti Tank (HEAT): PEN is constant at all ranges, and does not depend on the round's energy or caliber; instead find the thickness or armor steel that the weapon will penetrate, in inches (1" = 2.54 cm), and enter it into the formula below:

$$PEN = Thickness^{1.72} \times 34.1$$

in which *Thickness* is the number of inches of steel armor plating the weapon can penetrate.

High Explosive (HE): as for HEAT.

Damage Class (DC)

No formula has been found for this yet that will give a decent match. It is probably based on muzzle energy and caliber, but reverse-engineering attempts have so far failed. The obvious solution is that the Damage Class must be determined by "borrowing" from a similar weapon. Taking the exact values from a weapon firing the same ammunition from roughly the same barrel length tends to do the trick, though if there is no published equivalent, guesstimation will have to be employed.

High Explosive (HE) and High Explosive Anti Tank (HEAT): the DC is 10 at all ranges, regardless of the actual energy, PEN, or caliber of the round.

Three-Round Burst (3RB)

No formula has been found for this value either, so take this from a similar weapon or pick a value that looks good.

Minimum Arc (MA)

Calculate the MA at a range of 10 hexes by using this formula:

$$MA = (Energy \div Mass) \times 0.0008$$

Energy is the muzzle energy of the weapon, in joules, and *Mass* is the weapon's mass in kilograms.

Once the MA for a range of 10 hexes has been found, to calculate it for the other ranges, multiply it by the range and divide by 10. For all values, round fractions nearest; if the value is less than 1, round to one decimal, while values larger than 1 are rounded to the nearest whole number.

Ballistic Accuracy (BA)

Refer to a weapon firing the same caliber and type of ammunition as the weapon you are designing, and copy the BA data from there. If none exists, you'll have to guesstimate the values based on existing, similar calibers.

The progression for Ballistic Accuracy uses the following formula, however (with thanks to Brian Biswell):

$$BA = BA_1 - WF \times (\log(Range \div Range_1) \div \log(2))$$

BA is the Ballistic Accuracy at the range under consideration, in hexes, and BA_1 is the Ballistic Accuracy at the range for which the BA is known. *Range* is the range (in hexes) for which the BA is being calculated, while $Range_1$ is the range, also in hexes, for which the known BA applies, and finally *WF* is a Weapon Factor which is 9 for most weapons (pistols, rifles, machineguns, etc.), except, for shotguns for which it is 10.

Fast Pistol Rounds

Sharp-eyed readers will notice that pistol rounds can actually have a lower TOF value than rifle rounds at ranges up to 20 hexes. I don't know why this is either, but it's the way it came out of my regression program. Since at these ranges the TOF values are typically 0 or 1, it usually won't matter anyway, especially with the higher velocities of pointed bullets.

Time Of Flight (TOF)

This can be calculated for each range by dividing the value from the following table by the weapon's muzzle velocity in meters per second, rounding all fractions down. As with the PEN, different values apply for pointed and round-nosed bullets, to allow for the differences in their aerodynamics.

	Base Value	
Range	Round-nosed bullet	Pointed bullet
10	350	500
20	500	750

40	1,000	1,000
70	1,700	1,500
100	2,500	2,250
200	5,250	4,500
300	8,500	7,250
400	12,500	10,000

EXPLOSIVE WEAPONS

There is also an explosive weapons designer to make this task easier on the pocket calculator.

As with firearms, it is a good idea to compare the stats of the grenade you end up with, to stats of a similar grenade in a Phoenix Command rulebook.

Length (L)

The grenade's length across its widest points, rounded to the nearest 0.1 of an inch.

Weight (W)

The grenade's weight, rounded to the nearest 0.1 pounds.

Arm Time (AT)

Arm Time for a typical handgrenade which is activated by a pull-out ring is 3. This may be increased if additional operations must be performed to activate the fuse, such as in the Chinese Type 82 grenade where a cap must first be removed.

Fuse Length (FL)

Equal to the time delay of the grenade, in seconds, divided by 2 and rounded up. Grenades with an impact fuse have an FL of "I".

Range (R)

For hand grenades, convert the commonly-quoted throwing range of the grenade to hexes by multiplying the range in meters by 0.45, or the range in yards by 0.5, for the range in hexes. Round to the nearest whole hex.

Rifle grenades use the same method, but you should use be sure to take the *direct* fire range, not the maximum range for indirect fire. If only one of the two is listed in references, it is safe to assume that the maximum direct fire range is equal to half the indirect fire range.

Explosive Charges

In modern hand grenades, the explosive charge typically consists of TNT, TNT mixed with RDX, or composition B. In older grenades, from around World War II onward, charges are typically TNT only, while still older grenades employed all kinds of explosives. In World War I, for example, amatol and even black powder were commonly used, in addition to types for which no effectiveness ratings are available at this time. Up until the late 19th century, black powder was generally the only available explosive.

If you cannot find out what type of explosive is used in a particular hand grenade, TNT is a good type to default to. It is ubiquitous enough that the military uses it as a baseline (as witnessed by the ×1.00 effectiveness multiplier) and so

Penetration (PEN)

The Penetration rating of a grenade at Contact range is based on the weight of explosives in the grenade, using this formula:

$$PEN = Explosive\ Mass \times Effectiveness \times 11.4 + 1.74$$

in which *Explosive Mass* is the weight of explosives in the grenade and *Effectiveness* is a factor based on the type of explosive used, as per the table below.

At a range of 0 hexes, the PEN can be calculated with this formula:

$$PEN = Explosive\ Mass \times Effectiveness \times 17.0 + 0.23$$

Explosive type	Effectiveness
Amatol 80/20	×1.17
Ammonium nitrate	×0.42
Black powder	×0.55
Composition B	×1.35

there's a good chance it fills the grenade you're designing.

Mixing Different Explosive

Especially in modern grenades, mixtures of different explosives are used. For these, you can find the effectiveness rating by multiplying the individual ratings by the percentages. A charge consisting of 55% RDX and 45% TNT, for instance, has an effectiveness of 0.55 × 1.50 + 0.45 × 1.00 = 1.28 (rounded off).

If there is only a very small amount of one type of explosive, you can generally disregard it. The American M26A2 grenade, for example, contains 156 g of composition B and 8 g of tetryl. That gives a combined effectiveness of 1.34, compared to 1.35 for a charge of 100% composition B.

Composition C3	×1.34
Composition C4	×1.34
Dynamite, Ammonia	
40%	×0.41
50%	×0.46
60%	×0.53
Dynamite, Gelatin	
40%	×0.42
50%	×0.47
60%	×0.76
Dynamite, Military	×0.92
Dynamite, Straight	
40%	×0.65
50%	×0.79
60%	×0.83
PETN	×1.66
RDX	×1.50
Tetryl	×1.25
Tetrytol	×1.20
TNT	×1.00

Damage Class (DC)

The DC for a grenade is always 10 at Contact range. No method has been found yet to calculate the DC at other ranges, though.

Eero says…

While this table is not based on any real-life values (for example it does not take the grenade's BC into account) it does produce results of some consistency, the only grenades which seem out of place are the Type 59/RDG 5 and the French DF 37. After you've found the PEN_0 and DC_0 of your grenade, find other grenades (or artillery shells) with same or similar value and copy their data for other ranges for your grenade. For my design I found nearly equivalent data in the 76 mm gun table of the Artillery Supplement.

More About PEN and DC

by Eero Juhola <ejuhola@sci.fi>

In principle the more BC your explosive generates and the lighter your fragments are, the faster the fragments should go. And the heavier the fragment, the more damage it does. But for now you can attempt something like this: Divide the grenade's Weight (in lbs.) by the $BSHC_C$ and see where your grenade fits in on this table:

Grenade	$BSHC_0$	PEN_0	DC_0	$W/BSHC_C$
DM 51	*27	1.4	1	0.0005
HG78	*23	1.4	1	0.0006
MDN 21	*9	1.4	1	0.000714
MU 50	*6	1.4	1	0.001
HG80	*4	1.4	1	0.001333
NR423	*4	1.8	2	0.001667
M26A2	*4	2.4	2	0.003
Type 59/RDG 5	*3<	2.9	3	0.0035
L2A2	*3	2.4	2	0.0045
M61	*3	2.4	2	0.005
Type 82	*1	3.2	3	0.006667
M67	31	4.9	6	0.03913
DF37	41	1.9	3	0.04
M68	28	5	6	0.042857
RKG-3M	12	10	8	0.26667

Base Shrapnel Hit Chance (BSHC)

Fragments

The number of fragments for modern grenades is frequently listed in the grenade's description in the more detailed kinds of weapon book. For older types, though, such as those from World War II and before, it can be very hard to find.

It should be noted that one way *not* to determine this number, is to count how many "blocks" there are on a "pineapple" grenade. It has been found that the external grooves on these grenades have absolutely zero effect on fragmentation — they fragment according to imperfections in the outer shell, not along any grooves cast into it.

Determine the number of fragments produced by the grenade, and divide by the values from the table on the right for each range.

Range in hexes	Divide number of fragments by
C	3.25
0	240
1	1,000
2	4,000
3	16,000
5	256,000
10	26,200,000

For each range where the BSHC is 0.50 or higher, round to the nearest whole number and add * before it to indicate this is the number of automatic hits. If the BSHC is less than 0.50, multiply it by 175 to find the percentage chance of a hit.

Blast grenades have no BSHC.

Example: a grenade holds 5,000 pre-formed fragments. At Contact range its BSHC is 5,000 ÷ 3.25 = 1,538; this is rounded to *15H. At range 0 hexes, its BSHC is 5,000 ÷ 240 = 20.8, rounding to *21. The following BSHC figures are calculated for the various ranges:

Range	Calculation Result	Rounded Off	BSHC
C	1,538	1,500	*15H
0	20.8	21	*21
1	5.00	5	*5
2	1.25	1	*1
3	0.312	0.31	54
5	0.0195	0.019	3
10	1.90×10^{-4}	0	0

Base Concussion (BC)

At Contact range, the BC can be calculated using this formula:

$$BC = (87 \times Mass \times Effectiveness) - 90$$

BC is the Base Concussion, while *Mass* is the weight of explosives in the grenade, in grams, and *Effectiveness* is based on the type of explosive used in the grenade, as for Penetration (above). The table at right has those values for common types of explosive.

For plain explosive charges (such as the two TNT charges in the PCSACS rulebook), divide the charge weight in kilograms by 5, add 1 to it, and multiply by the BC calculated above.

Example: a 4-pound TNT charge weighs 4 ÷ 2.2 = 1.818 kg, or 1,818 g. Its BC is calculated as (87 × 1,818 × 1.00) – 90 = 158,076. This is then multiplied by 1 + (1.818 ÷ 5) = 1 + 0.3636 = 1.364, making it 215,552. For ease, that's rounded off to a BC of 22T.

The BC for range 0 can be calculated by dividing the BC found above by 17.5. For the remaining ranges, the BC must obviously drop off, but there do not seem to be any fixed multipliers or formulae for this reduction. Another thing that must be estimated, it seems :(

ROCKET & GRENADE LAUNCHERS

These weapons are essentially combinations of normal ranged weapons and explosive weapons, and so their design is a combination of the rules sets for Firearms Design and Explosive Weapon Design, above. Some additions and modifications are necessary, though.

Maximum Range (MR)

Many rockets, grenades and other explosive weapons have a timed fuse in addition to the impact fuse, in order to self-destruct the round once it travels a certain distance from the weapon. The MR is equal to this self-destruct distance in 2-yard hexes. There is no need to calculate penetration and damage data beyond this range.

Angle Of Incidence (AOI)

This indicates the angle at which the projectile strikes the target, and is used in the rules on page 8 of the Mechanized Combat System to determine hits to the top surfaces of a vehicle.

The AOI is equal to one-tenth the angle under which the round would impact on level ground, rounded to the nearest whole number. For example, if a projectile were to impact under an angle of 20°, its AOI is 2.

It must be added here that I have no idea of how you would go about discovering the impact angle of a grenade in the first place, but hey, at least we know how to calculate the game data derived from it :)

Phoenix Command Small Arms Combat System by LatwPIAT

1 Character Generation

2 Movement & Combat

3 Advanced Rules

4 Game Tips and Playing Aids

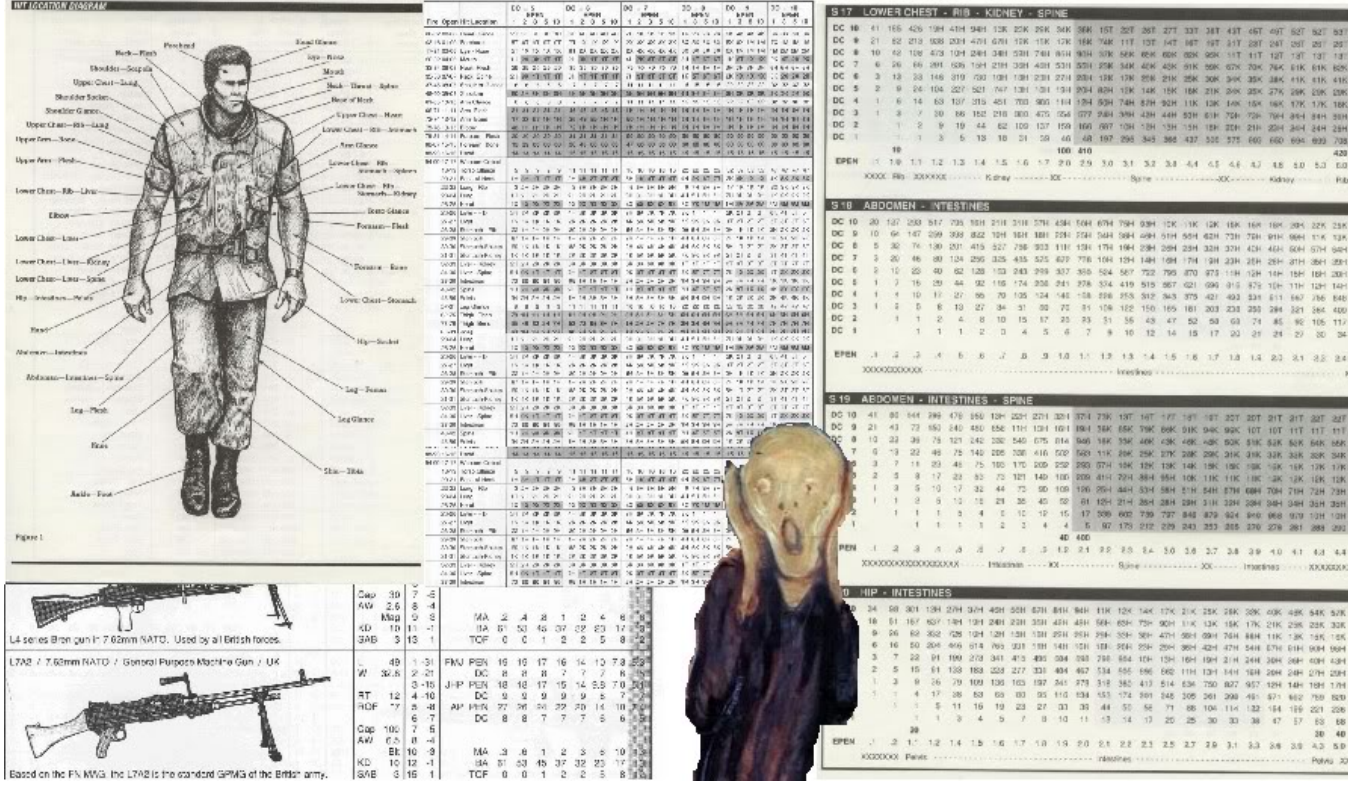
5 Optional Rules

Character Generation

posted by LatwPIAT Original SA post

The **Phoenix Command Small Arms Combat System** , or "PCCS" for short, is... not actually a role-playing game. It's a tabletop miniatures wargame for modern squad-level firearms combat. However, it mentions that it *could be* used together with an RPG if you want Realism!, so I'll talk about it here anyway. Especially since RPG players tend to talk about it in hushed voices and parade it around as an example of realism gone too far.

When people talk about the horrors that are PCCS, then tend to talk about things like this:


HIT LOCATION DIAGRAM
S 17 - LOWER CHEST - RIB - KIDNEY - SPINE
S 18 - ABDOMEN - INTESTINES
S 19 - ABDOMEN - INTESTINES - SPINE
L4 series Bren gun in 7.62mm NATO. Used by all British forces.
L7A2 / 7.62mm NATO / General Purpose Machine Gun / UK
Based on the FN MAG, the L7A2 is the standard GPMG of the British army.

(Image not by me)

Tables. Tables. Oh so many tables. (The tables are far from the worst part of the game.)

Chapter 1: The Character

Chapter 1.2 tells you that your character has five characteristics; Strength, Intelligence, Will, Health, and Agility. Chapter 1.3 tells you that your character has six characteristics; the five aforementioned and Gun Combat Skill Level (GCSL). Editing is not really one of PCCS' strong points.

So, what are our characteristics?

Strength (STR): Your physical strength. The game mentions that high strength makes you capable of lifting more. It fails to tell you that high strength makes you move faster.
Intelligence (INT): Your mental dexterity. The game mentions that Intelligence makes you better at combat by making you faster.
Will (WIL): Your resolve and willpower. The game mentions that Will makes you hurt less and be less scared when the bullets start flying.
Health (HLT): Your "physical health". The game mentions that it helps you recover from wounds. It doesn't actually have any other effects related to how healthy you are...
Agility (AGL): "Physical coordination and speed." While it's true that Agility makes you move faster, in the core PCCS, coordination doesn't really matter that much.
Gun Combat Skill Level (GCSL): Your "ability". What the game fails to mention is what GCSL actually does. Like, at all. I guess we can infer that it makes you shoot better, but GCSL isn't actually explained anywhere.

In short:
STR: Move faster and lift more
INT: Move faster (Usain Bolt: Supergenius!)

WIL: Get knocked unconscious less
HLT: Get knocked unconscious less and die slightly slower
AGL: Move faster
GCSL: Move faster, shoot better, and get knocked unconscious less

As you can see, there's a certain level of redundancy here. Which would perhaps be fine, were it not for the fact that some characteristics do the exact same thing, like INT and AGL. All characteristics are generated by rolling 3d6, except for GCSL, which is arbitrarily set by the GM. The game says that 10 in a characteristic is "average", which is somewhat amusing since the average of 3d6 is 10.5. It also helpfully tells us that 12 in a characteristic is "Above Average", as if that didn't actually follow from the definition of what an "average" is.

Then comes calculating all the derived characteristics! Oh boy! I hope you like multiplication. And looking up stuff in tables!

"How do you expect me to fight with this helmet on? And this ammo weighs a ton!" - Humbert NoDose

First we have to total up the weight of all the stuff our character is carrying, in pounds. This is a bit difficult since we haven't been told how gear works just yet. Then we have to cross-index our Encumbrance and our Strength on Table 1A (table-count: 1) to find our "Base Speed". The characteristic Base Speed is never used for anything in the actual game. For some reason, Table 1A has STR values from 1 to 21, despite a PCCS character being unable to have a STR lower than 3 or higher than 18. (It is useful if you're using PCCS with another system though.)

Then we cross-index our Base Speed and our Agility on Table 1B (table-count: 2) to find out "Maximum Speed". The characteristics Maximum Speed is *also* never used for anything in the actual game. In a *different* PCCS-based game there's a rule that says you can't move faster than your Maximum Speed per 2-second combat turn, but this is not actually a rule in PCCS, for some odd reason. The range of AGLs is 1 to 21, despite your character's AGL being the result of 3d6.

Then we look up our Gun Combat Skill Level in Table 1C (*ding!*) to find out Skill Accuracy Level (SAL). You can tell this is an 80's game by how everything is abbreviated. SAL is basically just GCSL+6, so one has to wonder a bit why PCCS bothers to have the two be separate in the first place.

"Blam. Blam. 'Stop.' Blam. 'Police.' Blam." - Officer Axly. (Axly will appear many times in the PCCS games, almost always as an example of what not to do.)

Then we have to figure out our Intelligence Skill Factor (ISF), which is GCSL+INT. We were thankfully saved having to use a table for this.

Then comes figuring out our actual number of combat actions. A cookie to everyone who figured out that this would require cross-referencing values in a table before I said so. You have to cross-reference you ISF and your Maximum Speed in Table 1D (*ding!*) to find your number of Combat Actions per combat turn. Table 1D doesn't have the complete range of

Intelligence Skill Factors though, and doesn't say whether we should round up or down when indexing. Each combat turn (called a "phase") is two seconds long, and divided into four half-second turns called "impulses". To figure out how many combat turns we have per in each of the four impulses, we have to index our Combat Actions in Table 1E (*ding*) Table 1D maxes out at 24 Combat Actions, but Table 1E just goes to 21, so what happens when you have 22 Combat Actions is not explained.

The last step is figuring out our Knockout Value (KV), which is 0.5*GCSL*WIL. If our *Gun Combat* Skill Level is 0, our KV is also 0 and our character will have a 1% chance to not get knocked unconscious from papercuts. Guns are everything in the world of PCCS.

"A Bullet in the arm // Does very little harm. // A bullet in the head // Can make your very dead" - Fred the Singing Bandit (sic)

The rest of the chapter contains an explanation of all the stats of your gun, a list of weights for various items, armour values for various kinds of gear, and some pregen characters. Each gun has about 14 characteristics, which is to say, your gun has more than twice the number of characteristics your character has. There's no explanation of what what the different armour types listed actually are. Is "light flexible armour" a bulletproof vest? Broiled leather? A thick jacket? What's the difference between Rigid armour and Medium Rigid armour? Each piece of armour has an armour value listed for its visor, if it has one. For Light Rigid, Rigid and Medium Rigid, the value is 0.8. A footnote helpfully tells me that Light Rigid, Rigid and Medium Rigid armours visors have an armour value of 4.

"If you can't dazzle them with style, riddle them with bullets." - Corley Norris (the motto by which Phoenix Command is written)

Table Count: 5
80's Action Film Dialogue Count: 5

As someone who's actually quite fond of *Phoenix Command* 's hyperdetailed firearms rules and hit-location tables, the system is incredibly poorly written. You have numerous characteristics that all factor into each other. Every time you throw a hand grenade, you have to go back to the character generation tables to see if lightening your load has changed your number of Combat Actions, a process that can require cross-indexing four different values in up to four different tables. The tables have huge, sprawling gaps in them with no indication whether to round up or down. At times, a table will simply cut off and offer no explanation what happens if your skill is above the norm. It's poorly written and poorly edited. If you want to use PCCS' for hyper-realistic firearms combat, stay *far away* from the character generation rules. Use everything else, but not the character generation rules.

Movement & Combat

posted by LatwPIAT Original SA post

Young Freud posted:

> He actually mentions why he brings up INT means "Move Faster". He means you get more actions. The tl;dr of it is that your STR vs. Encumbrance determines your Base Speed, then your Base Speed is cross-referenced AGI to determine your Max Speed, which when cross-referenced with the sum of your INT score and SAL/GSCL determines how many actions your character gets. Which, because the way actual movement works, more actions = faster speed since a 2-yard hex takes one Combat Action to move through.
>
> Since you can have 8 CA in a half-second impulse, that means you can move 32m/s. Despite what it says about Max Speed, it really doesn't have an effect on anything, since none of the movement rules ever mention them.

"she", actually. Also, in basic PCCS you can't get more than 6 actions per impulse, for a running speed of "only" 22 meters per second. That is to say, 80 kmh. Running. At these speeds you can expect to run across a lake and *not sink* from the sheer force of your feet pushing up from the water. A rather peculiar feature for a game that claims to model extreme realism...

Chapter 2: Basic Game: Movement and Combat

PCCS is played with "Phases" of two seconds each, divided into four half-second "Impulses". The game is played on a hexagonal map where each hex measures two yards across. PCCS uses US Customary Units, despite being written by a NASA engineer who really should know better. I guess he knew how to target his audience of hardcore American gun aficionados who were also into squad-level tabletop wargaming depicting the post-WWII period.

You have a bunch of Combat Actions (CA) and these are used to do stuff. Most things the game is interested in modelling, like shooting guns and moving, have CA values listed. If no value is listed, you multiply the number of seconds it would take the average person by 2. Since people skilled in Gun Combat are faster than the average non-combatant, this means that soldiers read the newspaper and cook gourmet meals faster on average. Nations with conscription, consequently, have much more efficient workers in their industries, which is why the Soviet Union outproduced the US during the Cold War.

Sometimes you can do two things at once, like run and aim at the same time. If you chose to do two things at once, you can double-spend your CA on both actions. Fair enough, but the

game should perhaps give some actual guidelines for which actions can be done simultaneously and which can't. The only example given is that you can't aim at two different targets at once, but it'd have been nice to know whether I can throw a grenade at a target while also aiming at it, and if I can triple-spend my CA to also move while doing this.

PCCS uses a system of declare-simultaneously-resolve-afterwards, which is a) realistic, and b) a bookkeeping hassle. It does help here that most characters only have one or two actions per Impulse, so there's little to keep track of, at least. Then, just to make things difficult, players are allowed to *change their minds* about what actions they took in response to what other people do. The examples given are quite reasonable: "I choose to Aim but my opponent decided to Walk behind a wall, so I change my Aim action to a Fire action to shoot him before he disappears behind the wall" and "I'm being shot at so I decided to go Prone", but there are no limitations on what you can change your mind about, and no rules for handling what happens when people keep changing their minds.

PCCS keeps track of your character's field-of-view. There are no rules that prevent metagaming around this in the wargame, but if you were using this for an RPG, it does provide an opportunity for proper fog-of-war. One pretty cool thing PCCS does is to incorporate tunnel-vision; if you're aiming down the sights of your gun, your field-of-view is halved, so walking around with your gun raised to your eyes like a true SpecOps SWAT Badass Operator lowers your tactical awareness. You can also spend CA to turn your head to look around you in a 360-degree field-of-view to spot enemies.

Rather annoyingly, the rules are unclear on whether looking around ruins your aim bonus or just freezes it.

Shooting stuff: the reason we're all here:

"There is no such thing as excessive violence." - Gill the Treacherous

To shoot something, you have to aim at it. To aim at something, you can either spend 2 CA to raise your gun and look through the sights, or just fire from the hip. Each and every single gun has its own small table (*ding!* x a whole lot) of Aim Time Modifiers; the more CA you spend on aiming, the more accurate your shots will be. Mechanically it means there's a fine granularity between quick-and-inaccurate fire and slow-and-accurate fire, and that different guns give you different capabilities. Heavier guns have higher initial penalties, but aim faster. The longer the distance between the front and rear sights, the longer time you can spend aiming to rack up higher Aim Time Modifiers. (I actually reverse-engineered the relationship between a gun's weight and its Aim Time Modifiers. Without going into a lot of detail, the aim time modifier *a* at a number of CA of aim *t* is given by a = x*log(t)+y, where x=b*log(w)+m and y=c*log(w)+p, for the gun's weight *w* and some constants *b, c, m* and *p* .)

Then when you've aimed you add the Aim Time Modifier to your SAL, and cross-index your ATM+SAL and the range to the target in the Odds of Hitting Table (*ding!*) to get a target number between 0 and 99. Then you roll 1d100-1 and try to roll less than or equal to the target number.

This part of the game is actually quite clever. When you fire a gun in real life and in PCCS,

your shots will follow a Guassian distribution. It's most likely that your bullets will go straight forward, but it's also fairly likely they'll deviate a little to the either side of "straight forward", and slightly less likely that they'll deviate even more to either side, etc. The probability of hitting your target is the probability that you shot will fall within some distance from of the centre of your aim. The Odds of Hitting Table is basically this Guassian probability distribution made into a table. It actually conforms quite nicely to the probability distribution for hitting of US Army soldiers. Which I know because there are tables of to-hit probabilities at different ranges and skills for US Army soldiers in the US Army Rifle Marksmanship field manual. Which I have studied extensively and compared to PCCS values...

...I really like gun prawn, OK?

Oh, yeah, 1d100-1. PCCS uses the d% convension where double zeros on the dice are read as, simply, "0" rather than "100", giving the dice a range of 0-99. What the game *constantly* forgets is that this means that, for a target number of X, you have a X+1% chance of succeeding; the game will gleefully tell you that "your target number is 86, so you have an 86% chance to succeed". It's rather amusing how the game employs advanced statistical models in painstaking detail, and then manages to screw up how their own dice system works.

There are also a bunch of other things that can modify how accurate your shots are. There are three different Stances you can be in; Standing, Kneeling and Prone, which give different bonuses to shooting. To find these bonuses, you have to refer to a table (*ding!) that strangely enough contains *four* different Stances. The difference between firing from the hip and firing with your gun raised are described as two additional Stances, which is pretty damn confusing since your firing Stance can be combined with any of the other Stances; Prone Hip Fire is a thing, as is Kneeling Aimed Fire. As you can see, clear communication was not one of PCCS' strong points. This probably did not help its reputation as incomprehensibly complex.

The last set of modifiers used in the basic game is the size of the target you're shooting at, which depends on its Stance and whether its exposed or just peeking around cover.

And then comes fully automatic fire. Fully automatic fire is awesome. First, you get +1 to hit. Then you shoot normally. Then, based on how far away your target is, you can hit it with several bullets. Which is to say that automatic fire is both more accurate and more deadly than normal fire. Is there ever a reason to not use automatic fire? Not really. You run out of bullets faster, but in the meantime you're a lean, mean, killing machine. Fully Automatic Fire in the PCCS basic game basically works like the US Army thought it would during the Vietnam War, so you're encouraged to get an autofire-capable M16 and lay down a hail of deadly bullets in the general direction of everyone who looks at you wrong.

At short ranges, you can even hit multiple people at once with a single burst. If they're clustered tight enough together, it's possible to hit more people than you fired bullets. Don't ask me how that works.

"Don't thing of it as being outnumbered, thing of it as having a very wide shot selection." - Generalissimo Puerco, President for Life

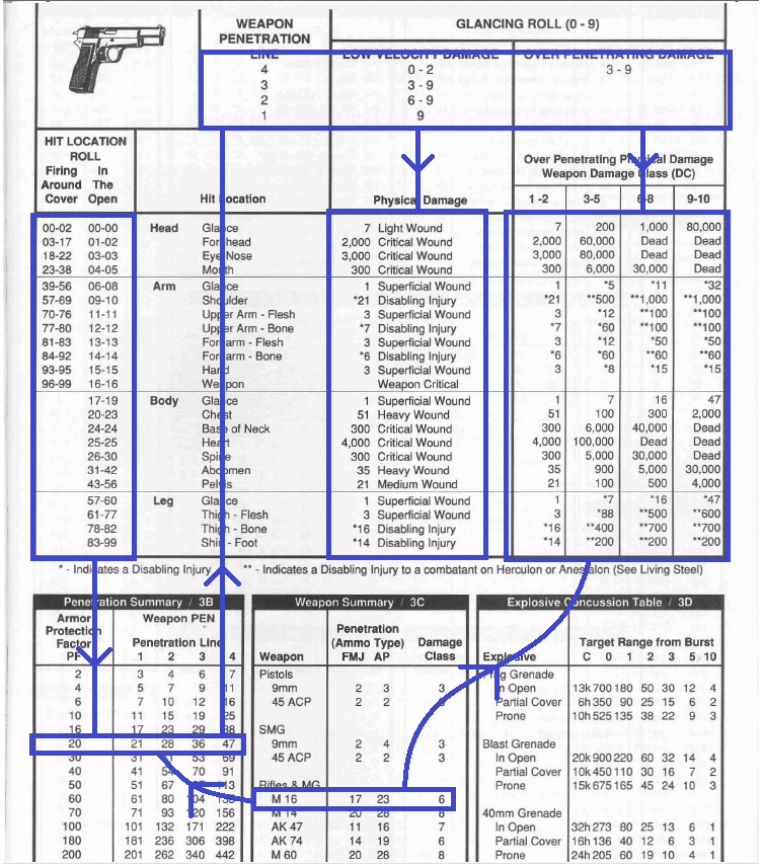
Getting shot: the reason we're not here:
PCCS Basic Game uses 23 hit locations, ranging from the general "hand" to the more specific "Upper Arm - Bone". When you get shot you roll 1d100-1 to determine when, and then start looking stuff up in tables. First you have to compare the gun's **PEN** etration with the Protection Factor (PF) of your armour in Table 3B (*ding!*). If the PEN of the gun is higher than your PF, the bullet actually penetrates. If the PEN is much higher than the PF, you might actually hit well enough to do some damage. Penetration is divided into four categories. Simply penetrating has a 10% chance of doing Low Velocity Damage, and a 90% chance of glancing off the armour. The second category of penetration has a 40% chance of doing Low Velocity Damage, and a 60% chance of glancing off the armour. With the fourth category, we have an actual 70% chance of dealing Over Penetration Damage, and a 30% chance of dealing Low Velocity Damage.

Table 3B doesn't say what happens if you have less than 2 PF as your armour. This would have been useful to know, since pistols have 2 PF and hence can't penetrate anything actually on the table. The rules also fail to mention whether to round up or down. Given that the backbone of the US Army, the M16, does not have PEN actually on the table, this can get rather awkward rather quick.

If we get hit with Low Velocity Damage, we're pretty lucky. Hits to the Forehead, Eye - Nose region and Heart will kill us very dead in less than three minutes. Hits everywhere else will take at least four hours to kill us, which means we'll probably have time to get to a hospital (which reduces our chances of dying drastically). If we get hit with Over Penetrating Damage, we have to cross-index (*ding!*) the weapon's Damage Class (DC) and the hit location to determine how much damage we take. The tables for Low Velocity Damage and DC 2 or less are identical and also right next to each other. A bit superfluous, that...

The actual amount of damage we take from being shot is modified by our HLT. The Physical Damage (PD) of a wound is PD = 10/HLT*damage. I like to imagine that everyone has HLT 13, so you have to divide by a prime number every time you someone gets shot. Quick, what's 210 divided by 13?

When we've determined the amount of damage we actually take, we can roll to see if we get knocked unconscious. We compare the sum of all damage we've taken so far with our Knockout Value. If our damage total is over 10% of our KV, we might get knocked unconscious. If our damage total is several times higher than our KV, it's very likely that we'll get knocked unconscious. The average soldier has a KV of about 20. The maximum possible KV is 180. Rather simply, the average soldier has a 11% chance of being knocked unconscious by anything that isn't a low-velocity glance. The most badass soldier we can imagine will have a 10% chance of getting knocked unconscious by everything that isn't a low-velocity arm or leg hit. Over Penetrating Damage is even worse; the average soldier has a 99% chance of being knocked unconscious by the average pistol round unless it glances or hits an arm.



WEAPON PENETRATION	GLANCING ROLL (0 - 9)	
	LOW VELOCITY DAMAGE	OVER PENETRATING DAMAGE
4	0 - 2	3 - 9
3	3 - 9	
2	6 - 9	
1	9	

HIT LOCATION ROLL Firing Around Cover	HIT LOCATION ROLL In The Open	Hit Location		Physical Damage		Over Penetrating Physical Damage Weapon Damage Class (DC) 1-2	3-5	6-8	9-10
00-02	00-00	Head	Glance	7	Light Wound	7	200	1,000	80,000
03-17	01-02		Forehead	2,000	Critical Wound	2,000	60,000	Dead	Dead
18-22	03-03		Eye, Nose	3,000	Critical Wound	3,000	80,000	Dead	Dead
23-38	04-05		Mouth	300	Critical Wound	300	6,000	30,000	Dead
39-56	06-08	Arm	Glance	1	Superficial Wound	1	*5	*11	*32
57-69	09-10		Shoulder	*21	Disabling Injury	*21	**500	**1,000	**1,000
70-76	11-11		Upper Arm - Flesh	3	Superficial Wound	3	*12	**100	**100
77-80	12-12		Upper Arm - Bone	*7	Disabling Injury	*7	*60	**100	**100
81-83	13-13		Forearm - Flesh	3	Superficial Wound	3	*12	*50	*50
84-92	14-14		Forearm - Bone	*6	Disabling Injury	*6	*60	**60	**60
93-95	15-15		Hand	3	Superficial Wound	3	*8	*15	*15
96-99	16-16		Weapon		Weapon Critical				
	17-19	Body	Glance	1	Superficial Wound	1	7	16	47
	20-23		Chest	51	Heavy Wound	51	100	300	2,000
	24-24		Base of Neck	300	Critical Wound	300	6,000	40,000	Dead
	25-25		Heart	4,000	Critical Wound	4,000	100,000	Dead	Dead
	26-30		Spine	300	Critical Wound	300	5,000	30,000	Dead
	31-42		Abdomen	35	Heavy Wound	35	900	5,000	30,000
	43-56		Pelvis	21	Medium Wound	21	100	500	4,000
	57-60	Leg	Glance	1	Superficial Wound	1	*7	*16	*47
	61-77		Thigh - Flesh	3	Superficial Wound	3	*88	**500	**600
	78-82		Thigh - Bone	*16	Disabling Injury	*16	**400	**700	**700
	83-99		Shin - Foot	*14	Disabling Injury	*14	**200	**200	**200

* - Indicates a Disabling Injury ** - Indicates a Disabling Injury to a combatant on Herculon or Anesalon (See Living Steel)

Penetration Summary / 3B

Armor Protection Factor PF	Weapon PEN Penetration Line 1	2	3	4
2	3	4	6	7
4	5	7	9	11
6	7	10	12	16
10	11	15	19	25
16	17	23	29	38
20	21	28	36	47
30	31	42	53	69
40	41	55	70	91
50	51	67	86	113
60	61	80	104	136
70	71	93	120	156
100	101	132	171	222
180	181	236	306	398
200	201	262	340	442

Weapon Summary / 3C

Weapon	Penetration (Ammo Type) FMJ	AP	Damage Class
Pistols			
9mm	2	3	3
45 ACP	2	2	3
SMG			
9mm	2	4	3
45 ACP	2	2	3
Rifles & MG			
M 16	17	23	6
M 14	20	28	8
AK 47	11	16	7
AK 74	14	19	6
M 60	20	28	8

Explosive Concussion Table / 3D

Explosive	Target Range from Burst C	0	1	2	3	5	10
Fragmentation Grenade							
In Open	13k	700	180	50	30	12	4
Partial Cover	6h	350	90	25	15	6	2
Prone	10h	525	135	38	22	9	3
Blast Grenade							
In Open	20k	900	220	60	32	14	4
Partial Cover	10k	450	110	30	16	7	2
Prone	15k	675	165	45	24	10	3
40mm Grenade							
In Open	32h	273	80	25	13	6	1
Partial Cover	16h	136	40	12	6	3	1
Prone	24h	205	60	19	10	4	1

"Who says Russian roulette isn't an acceptable way to rally a broken man?" - Lieutenant Axly

Death!

The more damage we've taken, the faster we die and the longer we take to heal. Table 8A (*ding!*) helpfully tells us how small our chances of survival are. We look up the amount of damage we've taken, and that tells us a) how long until we have to roll to see if we survive, and b) what we have to roll under. This ranges from 79 hours with a 95% chance of survival (5 damage), to 11 hours with a 13% chance of survival (200 damage), to 5 minutes and a 1% chance of survival (800 damage), to 4 minutes and a 0% chance of survival (900 damage). The low probabilities are a bit hard to roll under (especially the 0% chances), so if we can get someone to apply first aid to our dying character, the time interval and survival chance will go up. Going to an Aid Station will further increase our chances, as will going to a Field Hospital or the Trauma Centre of a modern hospital. When your time is up, you roll the dice. If you fail, you die. If you succeed, you survive.

This means that when your five minutes of furious bleeding are up, you have a 1% chance of *never being able to die from that wound* . Presumably the bleeding just stops or something.

Table 8A goes all the way to 100,000 damage, though one might wonder why. At 100k damage, you have a 0% chance of survival after 2 seconds. First Aid can extend this to a whole *twelve* seconds. How your fellow soldiers are supposed to drag you to an Aid Station in less than 12 seconds is simply not explained, not is it explained how you're supposed to get from an Aid Station to a Field Hospital in less than two minutes, or what kind of helicopter service can get you from a Field Hospital to a Trauma Centre in less than ten minutes. At less than 20k damage, you could reason that a SWAT team making an insertion would have an Aid Station ready at their van, and an ambulance ready to bring wounded to the nearest Trauma Centre at the ready, but anything greater than 20k damage really falls in

the category of "certain death".

Overall, I actually quite like the design idea behind this part of the system. Instead of hit points, you have a survival chance and bleed-out-time based on how badly damaged you are, and healing/survival comes down to administering first aid and rushing you to a hospital before you die from your wounds. It's a great idea, but is somewhat marred by a) coming packed in a parcel with all the other sub-par parts of PCCS, and b) just how mercilessly deadly PCCS is. Having someone get shot in the leg and having to desperately rush them to a hospital in the back of a beat-up sedan while a guy who failed medical school tries to administer first aid is great drama. Having someone bleed out and die from a chest wound before you've even got the bandage out of your pocket perhaps less so.

Table Count: 13 (+8)
80's Action Film Dialogue Count: 10 (+5)

The firearms handling and wound handling are the two things I really like about PCCS; at their core, they're both decent and highly realistic systems for dealing with in-fight and terminal ballistics. The problem is that PCCS consistently chooses the worst possible way to represent damage. Damage really should be measured on a log scale rather than a linear scale, since that would get rid of all the multiplication. The to-hit chances for firearms are realistic and really just require one master table and a few tables of modifiers (not exactly unusual in RPGs), but are marred by the fact they're stapled to the Stygian weirdness that is PCCS character generation. One of my homebrew projects at the time is actually a system that uses the ballistics-systems from PCCS, cleans them up, and attaches them to what will hopefully be a slightly more sensible chargen system.

...I've also written a PCCS retroclone that converts damage to a log-scale and explains the rules a little better. Because I love gun prawn. >_>

Advanced Rules

posted by LatwPIAT Original SA post

I considered doing a review of *World of Darkness: Gypsies* , but for once in my life I should actually complete a project before starting another one...

Chapter 3: Advanced Rules

The Advanced Rules aren't actually all that advanced. All the tedious complexity of PCCS got introduced in Chapter 2, and the Advanced Rules mostly cover adding detail to the system. Sometimes, the so-called "Advanced Rules" are actually simpler than the Basic Game's rules, *and* more intuitive.

Stuff the Advanced Rules add:

- A separate Range modifier to accuracy, found in a table (*ding!*), used to determine the chance to hit in another table (*ding!*)
- Modifiers to your accuracy based on the Visibility, found in a table (*ding!*)
- Modifiers to your accuracy based on the speed at which the target is moving, found by cross-indexing the range to the target and its speed in a table (*ding!*).
- Modifiers to your accuracy based on the speed at which you are moving, using the same table as above, but with special exceptions.
- Rules for ducking when under fire (these are not, as you might expect, "calculate your falling speed based on the local gravity to determine your vertical movement rate", but I wouldn't have been surprised if they were...)

Getting Shot, Part 2: Getting Shot Harder

There's also a more detailed system for hit locations (now there are 39 of them!). In the Basic Game, you did that terrible, over-complicated look-up process to determine your "Penetration Line". In the Advanced Game, you instead simply subtract the Protection Factor from the PEN(etration) of the gun to determine how deep the bullet penetrates. Conceptually, that's a lot easier for me to wrap my head around than the "Penetration Line" concept used in the Basic Game.

Of course, the Protection Factor is modified by a rolling 1d10 on a table (*ding!*) to determine the increase in effective PF from the bullet glancing off armour. It's the exact same amount of work as in the basic game, but conceptually clearer. But PCCS can't make sense for long, so no matter what you roll for glancing, the effective PF is *always* higher than the actual PF of the armour. Have a ballistic vest with PF 6? Even if the bullet doesn't glance, the effective PF will never just be 6; it'll be greater by a lot. This is extremely counter-intuitive, and certainly doesn't make PCCS any lighter on the brain.

For the record, I'm ~~reviewing~~ bitching about PCCS 3rd Edition; in PCCS 2nd ed., the glancing table actually makes sense. Why they changed it I can't say (~maybe they liked it better that way~).

The Basic Game's damage table fit on a single page; the Advanced Rules use a damage table that spans two entire pages and goes into unnecessary detail. You might have noticed that the Basic Game damage table eventually stops assigning damage and just says "Dead" - not so in the Advanced Game! There the table instead simply starts going into the low millions for damage - you might recall from Part 2 that anything above 20k is already certain death...

"Don't think of it as losing a leg. Think of it as eliminating the chance of tripping over your own two feet." - Dr. Oscar Sneiderbunk

But I digress...
Actually, there's probably a story behind that one. See, Barry Nakazono who wrote PCCS had earlier released a Fantasy RPG Heartbreaker (*Sword's Path: Glory*) and a modern firearms rules system called *Small Arms Spectrum* . While SPG would get condensed into the *Phoenix Command Hand To Hand Combat System* , SAS was actually less detailed than PCCS *and* more tedious. About half the time you look up things in tables in PCCS were done in SAS through mental arithmetic. In any case, one of the things there were rules for in SAS was how technological advance improved First Aid, which acted as a divisor to damage, getting quite significant at higher Tech Levels. In the 2030's and later, First Aid reduced damage to 17% of the original value. Damage in PCCS is proportional to the square of damage in SAS, so if you use the First Aid rules from SAS, you'd reduce the damage to about 2% - which brings 1000k damage down to 20k and into the survivable range. So somewhere in the process, it probably made sense to keep listing damage all the way to the low millions.

Still though, in *Phoenix Command* as a stand-alone game, it makes no sense whatsoever.

The Advanced Rules also include Shock, which is a form of "virtual" damage that is only used to determine whether you fall unconscious or not. It's not added to your damage total... but you still need to add it to your damage total when rolling to see if you fall unconscious. After multiplying through with 10/HLT.

Fully Automatic Weapons Baby!
There are now extra special rules for shooting people with automatic fire. First, you have to roll to see if you kept your gun aimed correctly height-wise. This uses it's own to-hit numbers found in a table as well as special modifiers for accuracy based on size *only in the height dimension* (i.e. height). The rules here are somewhat confusing; autofire is used against area targets, but your chance to hit is based on the height Accuracy Level Modifier of the target. Which means that if you aim at an elephant, it's easy to hit the mouse next to it, but if you aim the mouse, the chance is very high you'll miss the elephant... In any case, if you managed to hit the correct height, you then look at the width of your arc of fire and the rate of fire of your weapon, and refer to... *drumroll*

...another table (*ding!*) to determine what the chance is that every target in the zone you fired into gets hit. If the average chance is less than 100%, you have to roll once for every target (imagine firing at tightly clustered squad of a dozen enemy soldiers, and then rolling

twelve times to see if you hit any of them - knowing that for each hit, you have to roll for hit location, glancing, and knockout). If the average chance is greater than 100%, you hit with the average number of bullets. Always. Anything but the strict average is *streng verboten* .

And you can still hit with more bullets than you fired.

Amusingly, the Size Modifier table has normal, height, *and* width modifiers, but the width modifiers are not used with the autofire rules, so it's just as easy to hit a telephone pole as it is to hit a barn door.

One thing I do quite like is that, because autofire is splint into height and width, the rules include the tendency of automatic weapons to "climb" when fired in long bursts. Each time you fire an automatic burst, you get a penalty to your height to-hit roll, so the longer you keep firing, the more difficult it is to keep the weapon aimed at the correct height.

Shotguns
Shotguns are mechanically pretty similar to normal guns with a few elements of the autofire rules. You resolve the shot normally to determine if you shot in the right direction, and then shotguns have their own little special set of numbers to determine whether you you hit anyone inside their cone of fire with the pellets or not. At short range, you always hit with lots of pellets, while at long range the pellets are far apart so a person might avoid getting hit. It still has that problem where you always hit with the strict average number of pellets, and can hit people with more people than you fired.

The shotgun rules *do* take width into account, so you have to refer to a table (*ding!*) to determine how the target width modifiers the pellet hit chance.

There are also rules for automatic shotguns, which are a fine logical extension of the autofire and shotgun rules. This, of course, makes them tedious as fuck, because you have to first roll for elevation , then for each hit per target, then again for each target inside the cone of fire on each target you actually hit, then glancing rolls for each pellet that hit, then hit locations for each pellet, then knockout for each person who got shot. Fire an automatic shotgun at a dozen or so closely grouped people, and this can quickly become some well over 50 rolls for a single attack...

"Oops." - Ex-Officer Axly

Grenades - "Roll 2000 times on tables 6A and 6D and take the sum, before referring to tables 8A and 8B"

Remember when I said automatic shotguns were tedious? Try grenades. They're pretty much exactly like shotguns, but instead of firing at most 12 pellets per shot, an direct hit with a hand grenade can have up to two *thousand* pieces of shrapnel you have to determine hit location and glancing for. Even indirect hits can inflict several dozens hits on *each target* , requiring you to roll for many several hundred of pieces of shrapnel individually. (The game suggests rolling for location once and then assuming they all hit the same place, which is simple but somewhat bizarre...) And since grenades are indirect fire weapons, if you miss with a grenade, you have to use a table (*ding!*) to determine by how much you missed so you can

determine where the grenade landed.

There are automatic shotguns in the game, but there are no rules for determining where missing grenades land. It's also kind of pointless to use automatic grenade launchers for autofire, because their ROF is always 1, which isn't even listed on the autofire table.

Table Count: 23 (+9)
80's Action Film Dialogue Count: 18 (+8)

All in all, the Advanced Rules have a lot of good ideas handled badly. The shotgun rules are quite smart, and the autofire rules are neat, but they're heavily let down by how badly they handle large numbers. Most RPGs can handle *normal* , expected situations quite well, so what determines whether a RPG fails tends to be how it handles possible but unexpected situations. For *Phoenix Command* , the flaws of the system become clear when shotguns and autofire (or, heavens forbid, shotgun autofire) is used on thighly grouped targets. Suddenly, people are hit by more bullets than were fired, and the game screeches to a halt as players have to resolve several dozen dice rolls and determine damage from several dozen wounds at once. And the fact that some rules are simply missing doesn't actually make things any simpler. If the system had been streamlined, with clearer rules, it would probably have less of a reputation as an "over-complicated unplayable disaster caught up its own ass in details", and more of a reputation as a "very complicated and heavily detailed game for people into rules-heavy RPGs and minutiae".

Game Tips and Playing Aids

posted by LatwPIAT Original SA post

I've been holding off on doing this update because I've been distracted by schoolwork and making a *Phoenix Command* retroclone.

Chapter 4: Game Tips and Playing Aids

This is a short chapter covering practicalities outside of the game itself, such as a rundown of features new in 3rd edition PCCS, tournament rules, and two sample scenarios. There's not too much I can say about this. I haven't had a chance to play *Phoenix Command* in real life, nor do I really want to. The concept and attention to detail intrigues me, but the presentation

horrifies me.

Game Tips: Making tar play like syrup

The rulebook suggests delegating work such that each player handles their own character, an experienced player sits with the hit location table and rolls for effect, and the Referee refereeing the rules. It's not really objectionable in any way. If all you have is one copy of the rulebook things go faster if you don't need to shuffle it around between players, and asking players to keep track of their own character's wounds and rolling their own Save vs. KO has to the best of my knowledge been standard since Gygax invited some friends over to try his new game.

But, let's not forget that "keeping track of damage" includes multiplying through by 10/HLT every time you're hit. If you don't have a pocket calculator (this chapter doesn't suggest getting one), this means doing long division every time characters have a HLT that isn't 10. A friend of mine suggested the Referee moratorium that the only HLT values allowed should be 5 and 10.

Other suggestions is that you make a ranging stick marked with the target range modifiers, which is a pretty cool idea if you're playing on terrain-map or even on a hexmap. It does save you having to look up the range modifiers every time you shoot at something, and if you're from a miniatures wargaming background, you'd probably be used to pulling out a measuring tape every time you minis shot at the other guy's minis. PCCS is primarily a miniature wargame, so this is not unprecedented.

Lastly, it's also suggested that markers are used to keep track of visibility, since PCCS is pretty strict on what you can and can't see. Given the premise that you keep track of facing angles and visibility, this is not unreasonable either. It's not like a lot of games don't have field-of-view rules anyway, they just tend to be hard to enforce when the entire scene exists in the collective mind's eye of the players and GM, and everyone has their own ideas of exactly where they are looking. When you're playing on a tabletop with miniatures, these kind of rules become a lot more enforceable, since you know where everyone are and which direction they're facing.

Sample Scenarios: I have no idea how these play

The Bridge at Oppenheim
PCCS was first published i the 86, when Reagan had made the Cold War more pressing again by trying to measure his dick against a rather disinterested Gorbachev. One of the sample games in PCCS is of course a Cold-War-Gone-Hot scenario, where Russia has invaded West Germany. The third edition was published in 1989, which means the Warsaw Pact invasion of West Germany was either already somewhat dated, or very soon would be dated. In '86, it would probably have looked a lot more realistic, due to the near-disaster that was ABLE ARCHER. The game says it's day five of the Russian invasion of Germany, and the players are members of a "NATO squad" (who are armed only with US weapons) who've been tasked with holding a bridge near the town of Oppenheim. All in all, it's a very conventional, down-to-earth scenario about WWIII.

It's mainly an excuse to teach new players how the game works. Inexperienced Russian troops with AKM's with shitty ammo are moving through a chokepoint into an ambush set up by inexperienced US troops armed with M16's and machine guns. The players can win by either incapacitating 14 Russians on the first phase of combat, or by surviving for 60 phases. A quick look at some of the tables tell me that when shot, a Russian has a 78% chance of being knocked unconscious. There's a map provided of the location, thankfully, but the map doesn't have a *scale* , which is bloody annoying. Making a few estimates as to the scale of the map, it appears almost impossible for the US soldiers to miss at all, meaning it's quite possible the game will be over after that first round of *eight players firing six rounds each at 14 targets* ; as you may recall from earlier this means that each player rolls to hit... then once for each enemy soldier to hit again... then hit locations are determined for every soldier that got hit... then all soldiers that got hit have to roll to avoid KO. A phase allows four autofire attacks, so you can repeat all this rolling four times.

Things are complicated somewhat by the terrain, but it's still a scenario where you'll have to roll a *lot* when the bullets start flying. Perhaps good for teaching people the mechanics, but it might also horrify them on the mechanics. If you *don't* kill all the Russians in the first turn, the game goes on for another 59 phases. This represents a total of 2 minutes of in-game time, and might very well take the rest of the evening to resolve... It's also a very dangerous scenario for the players; they're dug in in sandbag positions that expose only their heads to risk, but my estimate for ranges informs me that a Russian that *does* survive to return fire will run a very high risk of hitting a player character - which will almost certainly do some very nasty things to that US soldier's face.

As written, the scenario is also unplayable; none of the soldiers have a HLT stat, which means you can't figure out how much damage they take. As mentioned, the map has no scale, so it's unclear how far away things are from each other. The map is not very interesting, and uses an abstract map-notation that doesn't really spur the imagination, and at times is unclear.

Police Raid
It's the 80's. The other scenario is a SWAT raid on a drug ring. I estimate this one to be a bit more friendly to the players. There are 10 skilled PCs going up against six less skilled criminals. The player characters wear body armour and can pick between an assault rifle, a shotgun, and an SMG as their weapon, while the criminals are armed with either assault riles or mere pistols. There are a number of scenario rules here describing how the criminals sometimes have to run and fetch their weapons, and how some of the drug-technicians will try to flee the building or surrender. There are rules for checking whether an enemy is armed or unarmed, and rules for arresting suspects. Annoyingly, there are rules for telling armed suspects to drop their weapons... but if a suspect is carrying a weapon, they *will* fight instead of surrendering. That's either some high-level police procedure simulationism going on, or it's utterly pointless to tell a suspect to drop their weapon, since that just lets them get the drop on you.

If it's simulationism, you can *also* play the cowboy cop who endangers civilians by firing wildly through the walls to hit suspects at random. There are rules for this.

All in all, it actually looks fun to play; with overwhelming firepower focusing on surviving the harsh reality of PCCS becomes easier, and with only six enemies some of whom might not

even try to fight back it'll be a lot shorter than slogging through The Bridge at Oppenheim. There's more variety in weapons available and in enemies. The map provided has a scale, though it's still not very interesting as it includes only the most relevant information; where are walls, doors, windows, and obstacles to movement.

Oh, and it's not playable, because there's still no HLT values provided, and it says to randomly distribute the enemies by dice roll, but the map doesn't tell which rolls lead to which locations. So hey, I'd kind of want to play it but *literally cannot* , because vital information is missing.

Table Count: 26 (+3)
80's Action Film Dialogue Count: 25 (+7)

The sample scenarios are on the surface of it somewhat dull, although they are playing right into that 80's sense of macho escapism. It could only be more 80's if instead of playing normal US soldiers you played Special Forces. However, the scenarios are let down quite a lot by the fact that they're *unplayable* . Leading Edge Games seems to never have done quality control on their products beyond proofreading. It's unacceptable, but I find it hard to be harsh here; it feels like one of those fantasy heartbreakers you see, only run under a completely different mindset and with ten times the amount of effort.

Optional Rules

posted by LatwPIAT Original SA post

Chapter 5: Optional Rules

This chapter details rules so detailed that they're not even used in the Advanced rules. There's not much meat to get into here, since there are many small rules that do very little all in all. There are:

- Rules for widening your character's Field of View
- Rules for spotting enemies
- Rules for hearing enemies
- Rules for making skilled characters better at not getting shot
- Rules for how long it takes for your character to plan what they're going to do next

- Morale rules
- Rules for knowing the exact tenth of a second something happened on
- Rules for follow-up shots
- Rules for aiming at locations in preparation of an enemy appearing there (e.g. doorway or cover)
- Rules for laying down covering fire (basically the automatic fire rules used against a hex)
- Rules for the differences between single and double-action weapons
- Rules for enemies being knocked down by the impact with a bullet
- Rules for determining *which kind* of incapacitation an incapacitating hit inflicted
- Rules for modelling characters who take dozens of bullets without dropping

The rest of the book is tables and gun stats. I'll go into detail about some of these though.

First, *Phoenix Command* is one of few RPGs that actually care about which direction characters are facing. This, together with the spotting rules, makes for a game where identifying where an enemy *is* becomes an important part of combat. This adds a fairly novel and realistic aspect to a firefight, but at the same time the rules are very time-consuming. Counters used on the map must have distinguishable facings, and both Referee and players need to keep track of who can see what. The book seem to imply a kind of hive-mind approach where both sides can see anything seen by anyone on their side, which is convenient, but a kind of giant, gaping hole in the realism. At the same time, like many games, there are rules for *spotting* enemies, but not any rules for *losing sight* of enemies. It can be handled by the judgement of the Referee, but it means that this game with its detailed rules for spotting enemies and player facing does not itself have structured rules for hiding and setting up quick ambushes.

That said, I feel the need to applaud the game for at least trying. I had some fun playing through *Rainbow Six: 3* this holiday, and from my own research into room clearing and military operations, reconnaissance and spotting enemies before they spot you is extremely important, yet most games gloss over it entirely. There are practical reasons for this - *Phoenix Command* demonstrates that it can be a laborious process - but the failure of many games to even try is at times grating. (On that note, *Phoenix Command* is almost perfect as a tabletop *Rainbow Six* game.)

The rules for hearing enemies are very realistic - everything is basically rated in dB, and you compare the volume of the sound you make against the background to determine whether you can hear it. Fairly simple, and I've run a short game using these rules; they add a tactical dimension where you can know where enemies are if they make too much noise, and sneak around and set up ambushes by carefully managing the sound you make yourself. That scene in Enemy at the Gates where Zaitsev masks his shots with artillery fire? This game has rules that let you do that. It's not always clear what kind of sound masks other sounds though, which is a let-down with these rules.

There are rules for planning your actions in this game, adding the realistic delay that comes in having to think about something. I can understand why these rules are optional, since they add a whole lot of overhead (you need to keep track of what you're planning, when you

started planning, how many 'actions' your plan requires, etc.) and complexity. I've been told from more seasoned PCCS veterans that these rules completely change the way the game plays and in some ways are preferable, because of the lulls in combat they create. I should note that "taking cover" and "returning fire" never use these rules, which is explicitly noted. Instead, it's for things like "moving out of cover, advancing down a corridor, opening the door, throwing a grenade in, ..." etc. A bit like the spotting rules, these are an attempt at realism that gets incredibly complex and time-consuming, yet at the same time it's interesting to see how that kind of realism actually affects a game, both from the realism-side and the game-side of things.

The game has morale-rules. Morale is, again, an often forgotten element of combat in RPGs, at best relegated to a specific niche attack, whereas in the real world all attacks on an enemy wear at their morale and willingness to fight. That said, the rules in *Phoenix Command* aren't very good and basically never allow characters to recover morale and get back into a fight. Their realism is more guesswork than the game's usual detailed physical models. (I know this because I happen to have read several research papers by the US Army on suppressive fire, and the models the US Army produced look nothing like PCCS' rules.)

The rules for knock-down add a *third* (fourth if you include the Morale rules) for getting enemies to stop shooting. There's killing enemies, incapaciting enemies, scaring enemies, and now simple knocking them flat on their back with the sheer momentum of being hit by a bullet. I think that last one is a bit overkill, and further not very realistic. Yes, people sometimes fall down when shot, but that has less to do with the momentum of the bullet and more to do with mental shock inducing a vasovagal syncope, or organ disruption causing momentary unconsciousness - which is already modelled by the incapacitation rules.

PCCS has 8-second long combat *turns* (almost never used) divided into 2-second combat *phases* , which are divided into 0.5-second *impulses* , which themselves are divided into 0.1-second *Master Phasing Counts* . The MPCs are not particularly egregious; they're provided as a tool to resolve what happens when two multiple things happen in the same Impulse and you need to know, truly, what happened first. For example, bullets have a Time of Flight (TOF) value that tell you how long they take to reach their target, in MPCs. If you get hit by a bullet the same MCP you fire a weapon, you take either a -10 or -20 penalty, depending on whether you make your Knockout roll. However, at short ranges many guns have TOF 0, just raising once more the question of what happens when two characters shoot each other at the same time. Additionally, there are no rules explaining what happens if the TOF is so large a target can move back into cover before it hits - does the bullet curve after them?

So, *Phoenix Command* . A revolutionary and unique game full of novel ideas that even 30 years later still haven't been copied. It is a complex game, make no mistake, but at the same time a lot of its reputation comes more from being poorly laid out and edited than actual complexity. It has lots of flaws, but at the same time I think its unique ideas and willingness to take the extra step to be a realistic game is admirable. There's a lot to be learned here, both good and bad.

Table Count: 36 (+10)
80's Action Film Dialogue Count: 29 (+4)

"My loyal troop! You came back to save me!" - Captain Stora
"Actually sir, we came back for your gun..." Gill the Treacherous

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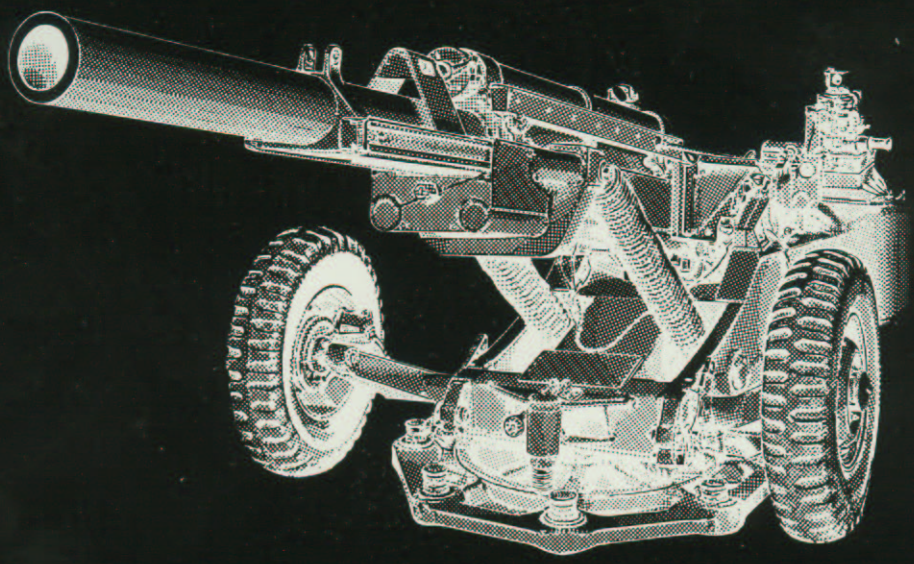
PHOENIX COMMAND™

Artillery System



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GAMES

PHOENIX COMMAND™

Artillery System

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Introduction

The **Phoenix Command Artillery System** is a part of the **Phoenix Command Combat System (PCCS)**. The components of the system are fully compatible, and many of the concepts, terms, and game mechanics used in other PCCS products appear unchanged in this one.

The **Phoenix Command Artillery System** allows PC players to add an entirely new dimension to the game. While the use of artillery lacks the immediacy of small arms combat and is an utterly impersonal means of making war, the fact remains that since the first military uses of gunpowder, artillery has been a major factor on the battlefields of the world, and its importance has never been greater than in this century.

This product includes a wide range of Indirect Fire weapons; Field Artillery, Mortars, and Rockets are presented, and the major powers from World War II to the current time are included. Chapter 1 contains the Basic Rules, and covers everything necessary for the addition of artillery to PC play. Chapter 2 has the Advanced Rules, which are used in special situations or by players who desire a higher level of realism. Weapon data is contained in Chapter 3.

Please note that either the **Phoenix Command Small Arms Combat System** or the **Phoenix Command Mechanized Combat System** is necessary for the use of this product.

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1

BASIC RULES

This Chapter contains the rules needed to add Artillery to **Phoenix Command**. Some of the terms used are defined in other products in the **Phoenix Command Combat System (PCCS)**, including the **PC Small Arms Combat System** and the **PC Mechanized Combat System**. Either one of those two products is necessary to use the **PC Artillery System**, although this product contains a great deal of general and technical information regarding the use of artillery, and may be of interest to students of the military.

1.1

THE USE OF ARTILLERY IN THE 20TH CENTURY

For centuries, the use of Artillery in war saw few changes. It was mostly a matter of brass cannon of varying sizes hurling heavy iron balls across battlefields and at fortresses, causing damage by sheer momentum. Occasional experiments with explosive shells were conducted, but irregularities in the powder and fuzes of the time prevented these projects from attaining wide use.

In the 19th Century, however, the Industrial Revolution made radical changes in the technologies available to the military, and by the beginning of the 20th Century those changes had been assimilated. Artillery pieces were manufactured with much greater precision and with a far higher level of mechanical sophistication, which gave them greater accuracy and reliability, as well as improved rates of fire. At the same time the transition from solid shot to explosive shells was made, and the range and destructive abilities of artillery were also greatly improved.

For the last fifty years, this has been the artillery piece of the modern battlefield; an efficient machine capable of firing hundreds of devastating high explosive rounds every hour, accurate enough to place the rounds within a few dozen yards of targets several miles away, and linked to other weapons and to observers in the field by sophisticated communications equipment. The Artillery is the least glamorous of the combat arms, and it is not usually mentioned in recruiting drives and ad campaigns. This does not change the fact that it has been a vital presence in every major ground action of this century, and is the single most important force for destroying enemy positions, inflicting casualties, and winning battles. In the words of Josef Stalin, "Artillery is the God of War."

1.2

SCALE

The scale used for Artillery is the same as the normal PCCS scale of 2 yards per hex, one-half second per Impulse, and 2 seconds per Phase. The **Phoenix Command Mechanized Combat System** uses a scale of 20 yards per hex and 8 seconds per Turn; guidelines for converting the information in this product to the Mechanized scale are contained in the Mechanized System.

1.3

FIRE MISSIONS

The majority of support fire that infantry units can count on is in the form of **Fire Missions** by indirect fire weapons. In modern warfare, these Fire Missions play the key role in both offense and defense, and are generally performed by Field Artillery, Rockets, and Mortars.

The mechanics of calling in a Fire Mission vary primarily in who has control of the artillery. The further up the chain of command the field commander has to go, the slower the process will generally be. Guidelines for the amount of time it takes for a Fire Mission to be called in are in Section 1.5. In most cases, a Fire Mission will begin with a Forward Observer.

"First, let's separate the cases into those who have insurance, and those who don't."

Dr. Oscar Schneiderbunk

The **Forward Observer (FO)** is a specially trained soldier who is responsible for directing artillery fire. As the name indicates, he is generally in the field with advanced forces and communicating with an artillery base that might be many miles away. To call in accurate fire from miles away, the FO must obviously make a number of calculations, most with the aid of maps, but some using his vision alone. The accuracy of these calculations plays the most important role in determining whether the artillery fire will be valuable, useless, or even dangerous to the FO and the other friendly troops in the field. At the same time, the FO decides on the number and types of rounds to be fired.

The FO's information goes into the chain of command, and passes through various levels depending on the type of support required. For example, if the FO is requesting support from a Battery attached at Division level, he will have to receive approval from all levels of command up to Division. This can be a slow procedure, naturally, and for important missions it is not uncommon for the FO to have prior approval, and a more direct link with the artillery that will be called in. This is especially true when a unit is part of a scheduled assault, or when it is known that they are soon going to be under direct attack.

Once the Fire Mission has been approved, the artillery crew begins the calculations that are necessary to make sure that the shells will fall in the appropriate location. Weather conditions are often a major factor in these calculations, so meteorological information must be provided. At the same time, orders go out clearing friendly aircraft from the area, to eliminate the risk of an accidental hit. Only after all of these preparations have been made will the Fire Mission commence.

"I'll distract him with idle conversation. You blow him up."

Lindsey

The Mission itself begins with one or more shots fired by a single artillery piece, in order to make sure that the FO's directions and the Battery's calculations are correct. Once the FO is satisfied with where the shells are landing, the full Fire Mission begins. Whether it consists of just a few rounds or of a sustained bombardment of hundreds of rounds, it is certain that the targets of the Fire Mission will immediately wish they were somewhere else.

Guidelines for Fire Missions are given in Section 1.8.

Notes on World War II

The rules which follow have been written with the Vietnam conflict in mind, and with standard US operating procedures as the basis. Less sophisticated military forces, especially the combatants in World War II, use their artillery in less controlled ways. Where the US practice in Vietnam was to provide artillery support for even the smallest units in the field, militaries without complex communications and command control structures are forced to use their artillery less subtly.

This was not too severe a restriction during World War II, where the vast majority of activity was by large, well-organized units moving through comparatively open terrain. The artillery was generally deployed in support of coordinated offensives and defensives, rather than the scattered patrols of modern warfare. In that role, the communications and other resources used were quite sufficient. The frantic, desperate encounters of Vietnam, dominated by small unit actions, infiltration, and difficult terrain with limited visibility, were many years away.

PLOTTING FIRE MISSIONS

As mentioned above, the Fire Mission is the standard way in which Artillery is used to support troops in the field. The number of artillery pieces involved in a given Fire Mission varies widely, from a single weapon or a battery of several pieces, to large, multiple battery Fire Missions of devastating power. The number of rounds fired per weapon is also highly variable, and depends entirely on the situation. For game purposes, there are up to three stages to a Fire Mission; Ranging, Adjustment, and Fire for Effect.

The first step for an FO is to call in a single **Ranging** shot, using coordinates which have been developed entirely by the FO's use of maps and his estimation of distances. The FO will watch carefully to see where the Ranging shot lands, and then call for an **Adjustment** shot if necessary. The Adjustment shot will include the FO's best estimate of how to correct for whatever error was involved in the Ranging shot. The FO will continue to call in Adjustment shots until he is happy with where one lands; at that point, he will issue the Fire for Effect command, and the full Fire Mission will begin. For game purposes, the place where the FO wants the shells to land is called the **Target Hex**, the location that the shells are plotted for is called the **Plotted Hex**, and the place where a shell actually hits, after accounting for the Shell Accuracy, weather, and any other factors, is called the **Impact Hex**.

If the Ranging shot is on (or acceptably near) the Target Hex, the FO will obviously skip the Adjustment shots and proceed directly to Fire for Effect; likewise, if a Battery has previously Ranged in on an area, it is possible to omit even the Ranging shot and go directly to the Fire for Effect portion of the Mission. This tactic has the advantage of hitting the enemy with a concentrated artillery attack without warning, and maximizes both the casualties and the morale effect.

"Don't put off until tomorrow what you can demolish today."

Corley Norris

Being a Forward Observer is a Skill, just like Gun Combat and any number of other abilities, as discussed in other Role-Playing Systems from **Leading Edge Games**. As with all Skills, a soldier's **Forward Observer Skill Level** can range from 0 to 20. Forward Observer Skill affects two major issues; how accurate the Fire Mission is, and how long it takes the FO to plot the fire. The following table lists the effects of a soldier's Forward Observer Skill Level on his Position Error (PE) and Plot Time.

FORWARD OBSERVER POSITION ERROR TABLE

Forward Observer Skill Level	Calculated Target Position Error	Spotted Target Position Error	Plot Time (Actions)
0	900	80	900
1	600	50	600
2	400	35	400
3	300	25	300
4	240	20	240
5	200	17	200
6	190	16	190
7	180	15	180
8	170	14	170

For each level above 8th, just subtract 10 more hexes from the Calculated Target PE, subtract 1 hex from the Spotted Target PE, and subtract 10 more Actions from the Plot Time.

The **Position Error (PE)** is the maximum error made by the FO; that is, the PE gives the maximum distance between the Target Hex (where he wants the Fire Mission to land) and the Plotted Hex (the actual coordinates he has given to the Artillery crew.)

The **Calculated Target PE** is used if the Forward Observer is using map coordinates to determine where the Fire Mission will land. It generally applies only to the Ranging shot; thereafter, the FO will tend to have visual information about the actual landing locations of any shells fired.

The **Spotted Target PE** applies in many different situations. It is used if the FO is actually with the weapons and is calling in fire on visible targets. Additionally, if the artillery has previously fired a Ranging shot at a site within the FO's view, he can use the site as a reference and may therefore use the Spotted Target PE. It also applies to Adjustment shots, as long as the FO can see where the shells land. To qualify for this column, the FO must observe the impact of the shell. This takes 10 AC after the shell detonates. Note that the FO must be watching when the shell lands, or must be listening carefully for the report.

"He sent his sympathies... postage due."

O. Man

There are some adjustments to the PE values given in the table. If the FO is calling in fire on a Calculated Target without maps, the PE value is tripled. For fire at Spotted Targets, the PE is doubled if the FO has indirect visual information about where the shell landed (if all the FO can see is the smoke or dust created by the detonation), and quadrupled if the FO must use sound alone to determine where the round landed. This is why White Phosphorus rounds are frequently used for Ranging shots in jungles and similar terrain, as they at least provide the FO with a large smoke cloud.

The **Plot Time** is the number of Actions used by the FO when plotting a Fire Mission. This includes making the necessary estimations, performing the calculations, and calling in the Fire Mission. When the FO is Adjusting Fire, the corrections to the Target Location take 1/10 the Plot Time.

1.5

FIRE MISSION TIME

Once the FO has called in the Mission, there is a noticeable delay before the shells actually begin to arrive. The reasons for the delay are touched on above; to confirm that the Fire Mission has authorization, to perform the necessary calculations, to clear friendly aircraft from the area, and so forth. Finally, the actual Time of Flight of the shells adds another delay of perhaps 20 seconds or more. For simplicity, all of these factors are included in the Fire Mission Time.

To find the **Fire Mission Time**, the FO rolls a number from 0 to 9 and adds 4 to it. (For those using the Crew Quality rule of Section 2.1, add the Crew Skill Level of the best unit supplying fire to the 0 to 9 roll). This total, called the **Fire Mission Speed**, is entered into the following table, and cross-indexed with the Fire Mission Type, to determine the number of Phases it will be before the first Shell arrives.

FIRE MISSION TIME TABLE

Fire Mission Speed	Fire Supplied By Artillery Fire Base	Fire Supplied By Company Level Fire Support	Fire Mission Speed	Fire Supplied By Artillery Fire Base	Fire Supplied By Company Level Fire Support
1	650	200	11	190	64
2	560	170	12	170	60
3	480	150	13	160	58
4	420	130	14	150	56
5	380	120	15	140	54
6	340	110	16	130	52
7	300	100	17	120	50
8	260	90	18	110	48
9	230	80	19	100	44
10	210	70	20+	90	40

The values in the table assume that the Fire Mission is being called in by a qualified person in the field who has no formal relationship with the Fire Base from which the Mission is being requested. Such a person has no direct influence or authority at the Fire Base, and therefore there are additional layers of red tape to deal with. For FO's with greater influence, one of the following modifiers may be applied to the Fire Mission Speed, as appropriate.

If the Fire Mission is being called in by an FO who is assigned to the Fire Base and who has been attached to the field unit, the Fire Mission Speed is modified by +3.

If the Fire Mission is being called in by an FO in an aircraft, there is a modifier of +5.

If the Fire Mission is being called in to a Battery or Fire Base which has been specifically assigned to the support of the FO on a particular Mission, the weapons are on Standby and there is a modifier of +7 to the Fire Mission Speed.

Example:

Derek is a Forward Observer on a long range patrol. When the patrol spots an enemy encampment, Derek Plots a Fire Mission and calls it in to his Fire Base. To determine his Fire Mission Speed, he rolls a 0 to 9 number and gets an 8. This is added to the Battery's Crew Skill Level of 4, for a total of 12. In addition, the Fire Base is the unit to which he is attached, and another 3 is added to the Fire Mission Speed, for a final total of 15. Consulting the table, the Ranging Shot for the Fire Mission will arrive in 140 Phases (280 seconds, or a little over 4 1/2 minutes.)

"I knew that someday, somehow, we'd both die. I just figured you'd be first."

Gerfel, his last words.
Wrong, as usual.

Once a Fire Mission is in progress, it is obviously much easier to call in corrections for **Adjustment Fire** or to begin the **Fire for Effect** portion of the Mission. To reflect this, the number of Phases it takes for Adjustment Fire and Fire for Effect shells is equal to 40 minus the Battery's Crew Skill Level, or 36 Phases for those not using that rule.

When the Fire for Effect order is given, the first several rounds will be fired at the rate shown in the **Weapon Data Tables** for Short Term Rate of Fire, or for Burst Rate of Fire, if the weapon is capable of firing Bursts. The exact number of rounds fired by each weapon at the Short Term Rate of Fire is equal to the Crew Skill Level divided by two and rounded up; for Burst fire, it is the number of rounds in the weapon's clip or rapid-loading mechanism, as defined in the weapon description. If no value is given there, then the number is again equal to the Crew Skill Level divided by two, and rounded up. Again, for those not using the Crew Skill rule, assume a Crew Skill of 4.

1.6

ACCURACY

Each weapon has three Accuracy values, which are used under different conditions and which are contained in the **Weapon Data Tables**. They are **Ranging Accuracy**, **Adjustment Accuracy**, and **Shell Accuracy**, and each is described below. In all cases, the Accuracy is given in terms of the **Scatter Radius (SR)**, which is the maximum number of hexes away from the Plotted Target the shell will actually land.

Ranging Accuracy: This is used for the initial shot in a Fire Mission, the Ranging shot. Once the FO has marked the location of this round, he will call in corrections and the battery will fire a second round.

Adjustment Accuracy: This is used for all Adjustment shots in a Fire Mission. With each shot, the weapon is hopefully closing in on the Target Location; this clearly depends heavily on the skill of the FO.

Shell Accuracy: Once the FO accepts the Ranging and/or Adjustment shots, he will have the weapon or Battery Fire for Effect. The Shell Accuracy is used for all further rounds in the Fire Mission.

Shell Placement

Whenever a shell is fired, these guidelines determine exactly where it lands. The rules given here cover the basic issues; for those desiring more detail, the **Advanced Accuracy** rules are in Section2.3.

There are two factors to where a shell lands; how far from the Plotted Target it is, and in what direction. These are referred to as the **Scatter Distance** and the **Scatter Angle**, respectively. The hex in which a shell lands is called the Impact Hex.

To determine the **Scatter Distance (SD)**, choose the greater of the FO's Position Error and the Accuracy; this distance is called the **Maximum Scatter**. Then enter the following table with a 00-99 number to find the Scatter Value, and multiply the Scatter Value by the Maximum Scatter to arrive at the Scatter Distance.

"Well, you missed the enemy, but that tree will never be the same."

Derek

SCATTER VALUE					
Roll	**Scatter Value**	**Roll**	**Scatter Value**	**Roll**	**Scatter Value**
00 - 01	.01	29 - 37	.20	79 - 86	.60
02 - 03	.02	38 - 46	.25	87 - 91	.70
04 - 09	.05	47 - 54	.30	92 - 94	.80
10 - 19	.10	55 - 67	.40	95 - 97	.90
20 - 28	.15	68 - 78	.50	98 - 99	1.00

For example, Chuck is an inexperienced FO calling in his first Fire Mission. He is 3rd Level in Forward Observation, and the Ranging Accuracy of the Battery is 37. Since Chuck's Position Error is 300, which is larger than the RA, the Maximum Scatter is 300. The GM rolls a 10, for a Scatter Value of .10. He multiplies the Maximum Scatter of 300 by .10, and the Scatter Distance is 30.

Scatter Angle

The Scatter Angle can be determined in one of two ways as shown on the following table.

"We have found after extensive research that living human cannonballs are only marginally effective, and can only be used once."

King's Men Scientific Manual

SCATTER ANGLE		
Percentile Roll	**12-sided die Roll**	**Scatter Angle**
00 - 07	1	0°
08 - 16	2	30°
17 - 24	3	60°
25 - 32	4	90°
33 - 41	5	120°
42 - 49	6	150°
50 - 57	7	180°
58 - 66	8	210°
67 - 74	9	240°
75 - 82	10	270°
83 - 91	11	300°
92 - 99	12	330°

The column labeled Percentile Roll is used in the normal way; roll a 00-99 number, and read across to the Scatter Angle column.

The 12-Sided Die Roll column is actually slightly more accurate, for those who have 12-sided dice. (They can be found in hobby stores, if desired.) For those who do not have a 12-sided die but desire the accuracy of that column, two six-sided dice can be used instead. The dice must be visibly different, whether they are of different sizes or colors. Simply choose one of the two dice as the "Determiner" and roll them both; if the Determiner is a 1, 2, or 3, enter the table with the value on the other die (1 through 6). If the Determiner is a 4, 5, or 6, however, add 6 to the value of the second die and enter the table with that value (7 through 12).

Note that on a hex grid, the 0, 60, 120, 180, 240, and 300 degree Scatter Angles are straight through the various hexsides of the target hex, and the Scatter Distance should be counted normally. The other Scatter Angles (30, 90, and so forth) go through the point

where two hexsides meet. If the Scatter Distance is an even number, that is not a problem; the shell will land cleanly in a normal hex. If the SD is an odd number, however, it will be placed on a hexside. The referee should roll randomly to determine which of the two possible hexes will be hit.

Battery Fire

A Battery is made up of two or more artillery pieces; in modern practice, batteries generally consist of 6 pieces, put larger and smaller batteries are not uncommon.

When an entire Battery is used for a Fire Mission, a single piece will fire the Ranging and Adjustment shots. Only when the Battery receives the word to Fire for Effect will the rest of the Battery open up. When determining where the Battery's shells fall, roll the Scatter Angle and Scatter Distance separately for each round, using the method described above.

1.7 *SHELL DETONATION*

When a Shell detonates, the following steps are followed to determine the effects it has on surrounding personnel.

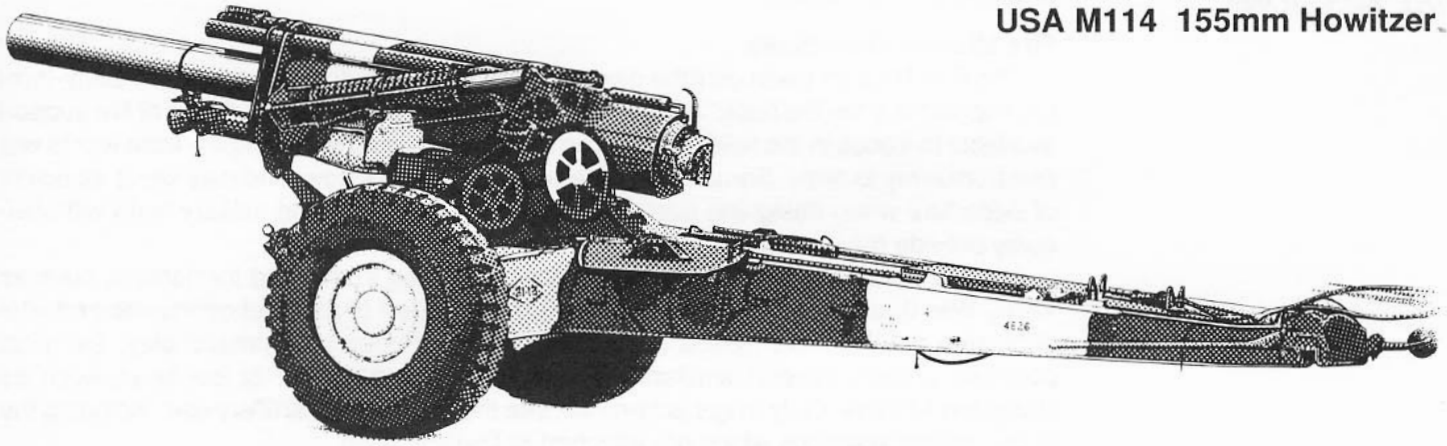
The **Shell Type** is the first issue. Since the numbers and types of shells are defined by the FO when he calls in the Mission, the players should simply refer to the appropriate Burst Data Table, using the Shell Index for the weapon that is firing. On the **Burst Data Table**, the player selects the **Burst Condition**, depending on whether the shell is an Airburst or not, and the type of ground in which the detonation is taking place.

At the top of each Burst Condition is the **Shrapnel Table** for the shell itself, and directly below that are the lines which give the Shrapnel Hit Chances and the Base Concussion for the blast. **Base Concussion** is applied normally to all nearby personnel. There are two types of Shrapnel Hit Chances; **Base Shrapnel Hit Chance (BSHC)** and **Base Shrapnel Hit Chance - Critical Range (BSCC)**. The BSHC is used for all personnel outside the Critical Range, as listed in the right hand column, while the BSCC is used for troops who are at that distance or less.

The **Critical Range** represents the area close to the detonation where personnel are subjected to the full shrapnel produced by the round, along with any rock fragments being thrown out by the detonation. The size of this area varies, depending on how deep in the ground the shell penetrates before detonating. The deeper it penetrates, the steeper the angle at which the shrapnel is thrown, and the smaller the area that is endangered. The BSHC represents only the shrapnel which is produced by the part of the shell which is above ground; this shrapnel is not restricted in its path, and endangers people at any range.

"Using living humans for terminal guidance has been completely ineffective on all spin-stabilized rounds."

King's Men Scientific Manual



USA M114 155mm Howitzer

Players should choose the appropriate Shrapnel Hit Chance for each of the personnel in the area. Note that the Critical Range varies, depending on the Stance of the target. People who are standing up are within the Critical Range at far greater ranges than those who are prone, which is part of the reason that soldiers throw themselves on the ground during artillery barrages. Once the appropriate Shrapnel Hit Chance line has been selected, the normal rules are followed to determine the effects. The Hit Chance and Target Size rules (Section 3.7 in 3rd Edition Phoenix Command) should be used when finding the actual BSHC or BSCC.

"I don't think any of us will ever forget Louie. Ever since the explosion, there's a little piece of him on all of us."

Trebor Nawoc

If a piece of Shrapnel does hit someone, the Shrapnel Table for that Shell and Burst Condition should be consulted. Just roll a 0 to 9 number, and enter the appropriate line to determine what the damage is. This table represents the different sizes of shrapnel which can be produced by a particular Burst; the higher the number rolled, the larger the piece of shrapnel which has hit the character.

In many cases there is another table beneath the Shrapnel Hit Chance and Concussion section. This is the **Fragments Table**, which represents any rock or wood fragments which are being thrown out by the burst. The BSCC for these Fragments is given at the bottom of the table, and is applied normally. If a hit is scored, a 0 to 9 number is rolled as above to determine what type of Fragment hits. The number of points of Impact Damage (ID) caused by the Fragment is entered in the **Impact Damage Table** below, to determine the number of PD applied to the character. Where these values are present for Ground Bursts, they should always be used. For Airbursts, the Fragments are only created if the explosion takes place in a wooded or jungle hex.

BLUNT IMPACT DAMAGE TABLE

		Impact Damage										
Rigid Armor		11	22	24	31	40	44	53	62	73	84	99
Flex Armor		4	7	8	11	15	17	20	24	28	32	39
No Armor		1	2	3	4	5	6	7	8	10	12	14
00-05	Head	1	2	4	34	2H	4H	7H	1K	2K	4K	6K
06-48	Body	1	2	3	6	11	18	27	37	61	1H	2H
49-99	Limb	1	1	2	4	8	15	19	23	43	72	1H

1.8

GUIDELINES FOR FIRE MISSIONS

A general guide to Fire Missions follows, as well as a detailed example of the complete process of a Fire Mission.

Fire Mission Guidelines

The Fire Mission given on hthe next pageis a good example of typical Company-level fire support in a "by the book" action. In the real world, the amount and type of fire support available to troops in the field depends on the situation, and varies widely from war to war and from army to army. Some basic notes on fire support follow, and may serve as points of departure when designing scenarios. Historical accounts and military texts will obviously provide the best guidelines for the use of artillery.

In wars where large, organized units are committed in massed formations, such as World War II, artillery fire is concentrated in the support of planned offensives and vital defensive actions. This means that in man-to-man Phoenix Command play, the most common artillery support available will be light units attached at low level, such as Company Mortars. Only major actions will see the full range of artillery use, including the larger-caliber weapons which are attached at Division level.

In conflicts where the action is dispersed, and where units rarely assemble into formations larger than the Squad or the Platoon, the use of artillery is very different and is subject to wider variation. In Vietnam, for example, a Squad of US troops in distress could very well expect the support of a full Battery of 105mm Howitzers, an undreamed of concept in earlier conflicts. For NVA and Viet Cong operating in the South, however, who had significantly less artillery available, a Squad in the field was quite isolated and could expect no support at all. On the other hand, during major NVA offensives such as Tet, they fielded the full range of artillery and operated in a manner very similar to a traditional military.

In general, the player or referee who designs a scenario should do the obvious things; scale the use of artillery to the size of the units involved, refer to historical sources for specific guidelines, and be sure to use the weapons that will make the game the most interesting for everyone.

Company Fire Support

A Company is on maneuvers, sweeping through a large area. It has a Battery of 60mm Mortars attached for immediate fire support. The Mortars are man-carried, and are being moved along a ridge from which they command a view of the Company's activities below.

Without warning a fire fight erupts in the valley below, with enemy fire coming from a tree line. The Mortar teams immediately deploy their weapons, and in a little over a minute (Deploy Time for a US M-19 60mm Mortar is 36 Phases, or 72 seconds) they are ready to fire. An FO travelling with the Mortar teams has used this time to begin plotting his fire. He is a 6th Skill Level FO, so his Plot Time is 190 Actions. At 4 Actions per Phase, it will take him 48 Phases to complete his calculations.

Therefore, 48 Phases after the start of fighting, the Mortar crews are set up and have a plotted target. They are Crew Skill Level 5, and an 8 is rolled, so the Fire Mission Speed is 8 + 5 (Crew Skill Level) + 7 (Battery on Standby) = 20. This means the Fire Mission Time is 40 Phases, using the column for Company Level Fire Support, and the Ranging shot lands on Phase 88 of the fire fight.

The weapon has a Ranging Accuracy of 32 hexes and a 6th Level FO with a Spotted Target has a Position Error of 16 hexes. The Maximum Scatter is the larger of the two, 32 hexes, and a roll of 36 on the Scatter Table gives a Scatter Value of .20. The Ranging shot falls .20 x 32 = 6 hexes from the Target Hex. This is within the general area of the enemy, so the FO immediately calls for a Fire for Effect with each Mortar firing 3 rounds. The first of these lands 40 (base Fire Mission Speed for Adjustment / Fire for Effect) - 5 (Crew Skill Level) = 35 Phases later. Each subsequent round from each Mortar lands one Phase later, using the Burst Rate of Fire. The first set of rounds of the Fire for Effect portion of the Mission would land on Phase 88 + 35 = 123, and the next rounds would land on Phases 124 and 125. It has taken a little over 4 minutes for a Battery of 60mm Mortars to deliver effective fire support to the Company. Further fire by the Battery would obviously depend on the situation, but if the enemy does not withdraw, they are clearly going to be subjected to a rain of increasingly well-directed Mortar fire.

"With all the wood I've taken out of you, I'll be able to build a new rec room."

Dr. Ezra Millstone

"Of course, since you've donated most of the material, you can visit anytime."

Dr. Ezra Millstone

"Of course, that hinges on the assumption that you pull through."

Dr. Ezra Millstone

2 ADVANCED RULES

This Chapter contains all the rules for unusual circumstances, and expansions on the level of detail found in the Basic Rules. Players may pick and choose from among the Sections below as they wish, but should be sure to agree which rules are being used before play begins.

2.1

CREW QUALITY

While the quality of a given gun will not change from situation to situation, there can be a wide range of quality in the crew for the gun. The modifiers shown below should be applied by the referee as is appropriate, based on the level of skill possessed by the artillery crews involved.

BATTERY CREW QUALITY MODIFIERS

Crew	Skill Level	Combat Actions	Scatter Radius Modifier
Militia	1st	3 AC	x2.0
Green	2nd	4 AC	x1.5
Line	4th	4 AC	x1.0
Crack	5th	5 AC	x0.8
Elite	6th	6 AC	x0.6
Expert	8th	8 AC	x0.5

2.2

MAXIMUM SCATTER MODIFIERS

The normal Maximum Scatter numbers represent the efforts of a crew working under fairly normal conditions. The following modifiers to the Maximum Scatter should be applied when suitable.

Light Wind	+30 hexes
Moderate Wind	+60 hexes
Heavy Wind	+200 hexes

The numbers given apply to all weapons which are not being supplied with sophisticated and reliable meteorological data, such as is available to modern militaries. If good meteorological data is available, then no modifier is applied unless the weather is irregular.

In irregular weather, meaning gusting winds and changing conditions, units with good weather data suffer the penalties listed above, while units without good data suffer double the normal penalties.

ADVANCED ACCURACY

The Basic Rules for Shot Accuracy present a fairly simple way of determining where a shell falls. For greater accuracy, the following method may be used. Instead of using either the greater of the FO's Position Error or the weapon's Accuracy, the referee will use both.

First the Position Error should be determined. This is calculated in the normal way, including rolling for the Scatter Value and the Scatter Angle, and the referee marks the **Plotted Hex** for where the Shell was actually targeted. Next, the Accuracy is found, again including the Scatter Value and Angle, and it should be placed on the map relative to the Plotted Hex, not the original Target Hex. In this way the two errors add together.

This makes it much more difficult for the FO to correct any mistake he has made, since the exact amount of his error is masked by the Artillery's error. The range of the error can also be far greater, of course.

Example:

Returning to the example in Section 1.6, the FO (Chuck) had a Position Error of 300 and the Battery had a Ranging Accuracy of 37. The roll for Chuck's PE is a 68, for a Scatter Value of .50, or 150 hexes away from the Target Hex. A 1 is rolled on the 1 to 12 roll for Scatter Angle, and the referee notes the hex that is 150 hexes from the Target Hex and at 0° as the Plotted Hex. The referee now rolls for the weapon's Accuracy and gets an 87, so the SV is .70 and the Scatter Distance is .70 x 37 = 26 hexes. Another 1 is rolled for the SA, so the Impact Hex ends up at 0° and 176 hexes from the Target Hex.

Not knowing how much of the error is his and how much the weapon's, Chuck decides to try to bring the Plotted Hex in by 176 hexes, which is 26 hexes at 180° from the Target Hex. His PE this time is 25 hexes; the referee rolls a 08, for a SV of .05 and a SD of .05 x 25 = 1 hex. The roll for the SA is a 3, so the current Plotted Hex is 1 hex up at 60° from where Chuck had planned. From there, the weapon's Adjustment Fire Accuracy is 29 and the roll for SV is a 96, for a .90. The SD is .90 x 29 = 26 hexes, and the SA roll is again 1, or 0°. This puts the Impact Hex for this round just 1 hex away from the Target Hex, and an elated Chuck calls for the Fire for Effect.

When the rounds come in, however, they will be centered on the current Plotted Hex, which is 25 hexes away from the Target Hex. This is obviuosly an extreme example of what can go wrong for an FO, but demonstrates the special problems involved in calling in an accurate artillery barrage.

"One more word out of you and you'll be our next adjustment shot."

Field Marshall Paul Maul

For the true aficionado, it is quite possible to use a protractor to determine the Scatter Angle; just generate a number from 1 to 360, and have the shell fall at that Angle. This method will have little appeal to anyone who is not a mathematician or an engineer, however, and with good cause. If the game includes players who spend time dissecting the possible Scatter Distances in such a way as to undermine the normal method, however, it may be advisable to use this system.

As a final note, it is obviously important to minimize the information which goes to the players. They should certainly not see any of the die rolls involved, and if possible the referee might wish to only supply them with vague information about their weapon's Accuracy and the values on the Scatter table.

Battery Fire

The basic Battery Fire rules use the Plotted Location for all the guns which fire. In reality, this is called **Converging Fire**, and is not the standard way that Batteries fire. Instead, batteries usually use **Parallel Fire**, in which the shells fall in a pattern which roughly approximates the layout of the guns in the Battery. The following rules should be used to represent this.

The central gun of the battery will be used for the Ranging and Adjustment shots, and

the others will fire only when the Fire for Effect command is given. The easiest layout of the other guns in the Battery is in a line based on the central gun. This is not ideal, because of its vulnerability to air attack and the inability of the guns to fire to the flank, but can be adopted out of simplicity and for ease of coordination. A more common formation is a five-pointed star, with a sixth weapon at the center; again, the central weapon is used for Ranging. The exact formation used should be determined by the player or referee according to the situation or in line with historical practice. The spacing between the weapons will also vary depending on the Battery and the situation, but for a typical battery of 105mm guns, the preferred distance is 100 yards, or 50 hexes, between weapons. In US Fire Bases in Vietnam, a spacing of 40 yards was more common, to reduce the Fire Base perimeter.

When determining the Impact Hex, the distance of the gun firing the shell from the #1 gun is included in the calculation. For example, if the #2 gun in a Battery is 20 hexes left of the #1 gun, the Plotted Hex for shells fired from this gun will be the same distance and direction from the #1 gun's Plotted Hex, and the Scatter Value and Scatter Angle should be determined from that point.

Note that the FO's Position Error will be the same for the entire Battery; only the Accuracy will vary per gun.

2.4

DIRECT FIRE WITH ARTILLERY

"Well, I realize it must be uncomfortable, but think how much worse it would be if the round had detonated."

Dr. Buen-scheuk

Although Artillery is designed to be used at long ranges, there are times when it must be used for short range and self-defense purposes. While this is substantially the same as direct fire with normal weapons, there are special problems involved in Traversing the gun and Depressing its barrel. Artillery also has a few special tricks which it can use to defend itself. Two of the most powerful are below; Flechette Rounds and Timed Airbursts.

When using Direct Fire with any Artillery piece except a Mortar, all the normal rules of PCCS are used in determining the Odds of Hitting, including Range, Visibility, Movement, Target Size, and so forth. (Unless specified in the weapon's description in the Weapon Data Tables, Mortars cannot use Direct Fire.) Unlike normal weapons, however, artillery pieces cannot simply be pointed at the target and fired.

First, the target must be within the **Traverse** of the weapon. The Traverse is given in the **Weapon Data Tables**, and is the number of degrees that the weapon's barrel can be tracked across without Repositioning the entire weapon. Half of this Traverse distance will generally be to each side of the current orientation of the weapon. If the target is within the Traverse angle, then the weapon may be aimed. If not, the weapon must be Repositioned. The number of Phases this takes is listed in the Weapon Data Tables as the **Reposition Time**. Once the weapon has been Repositioned in the correct orientation, Aim Time can begin.

Direct Fire Scatter

If an Artillery piece uses Direct Fire against a target and misses, the location of the shell's impact must still be found. Each weapon has consequently been given a **Direct Fire Error Value (DFE)** at each Range. The number of hexes between the target hex and the actual detonation hex is found using the following formula.

Scatter Distance = DFE X Difference in EAL

The **Difference in EAL** in the above equation is the difference between the EAL needed to hit, and the EAL for which the number actually rolled would have been a hit. Because the trajectory of the shell is so flat, a round which misses is likely to miss by quite a great distance.

For example, an artillery crew is firing a French 155mm TR at a jeep 300 hexes away. They have an EAL of 14, and therefore need a 27 to hit. They roll an 81, however, so they miss badly. Checking the Odds of Hitting Table, the referee sees that with a roll of 81, they

would have needed an EAL of 23 to get a hit; therefore, the Difference in EAL is 9. The DFE for a 155mm TR is 27 at that Range, so the Scatter Distance is equal to 27 X 9 = 243 hexes.

Once the Scatter Distance has been determined, the referee should roll a ten-sided die; on a roll of 0 through 2, the shot is short, and on a roll of 3 through 9 the shot is long. The referee should place the shell directly on the line of fire, at a distance from the Target Hex equal to the Scatter Distance. Note that it is not possible for a shell to Scatter short by more than 1/4 the Range.

Timed Airbursts

Another very effective use of Direct Fire is with normal High Explosive shells modified by special fuzes. These fuzes are timed to go off at a specific range from the weapon, which is fired with its barrel roughly level. The fuze detonates the shell as an Airburst at the specified Range.

For accuracy, use a Target Size of 10 and a Range of 40 Hexes. If the Shell scores a hit, then it is on the proper line and will detonate within 10 hexes of the desired Range. Just roll a 0 to 9 die to find the number of hexes, and another one to determine if it is long or short of the Range. (0 through 4 is short; 5 through 9 is long.)

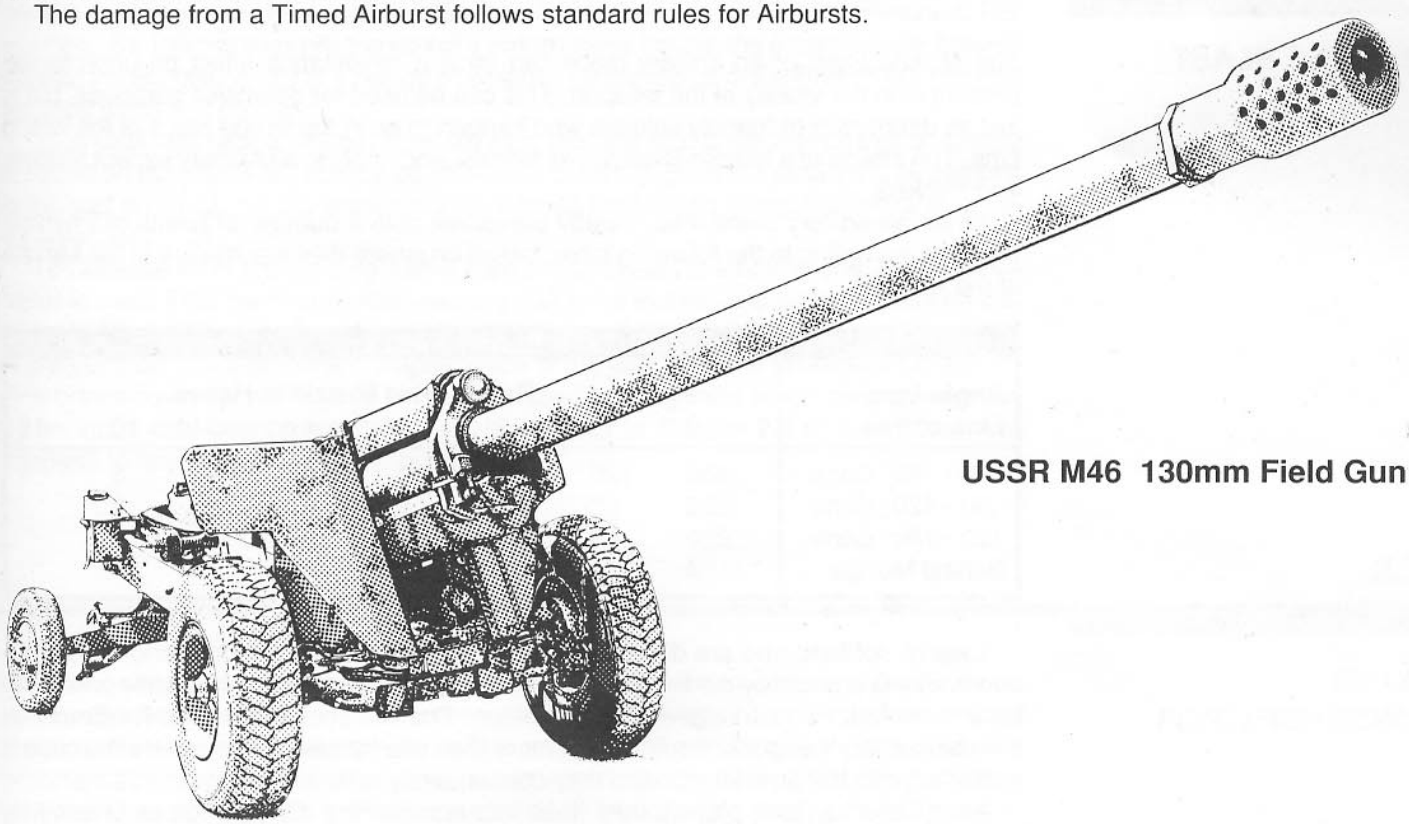
If the round misses, however, the shot will detonate to the left or right of the target. Use the normal PCCS Grenade Shot Scatter rules to determine the number of hexes by which it misses; on a 0 to 9 roll of 4 or less, it detonates this distance to the left of the desired hex, and on a 5 or more it is to the right. The 0 to 9 hex Range error described above is also applied.

To set the Range on the fuze, it must be prepared before loading. This takes 14 Actions. The shell can then be loaded and fired using the normal rules. For targets which are closing rapidly, the fuze should be set for a closer Range than the enemy has reached, and then loaded into the weapon. At that point, the crew simply holds fire until the enemy is at the appropriate Range, at which time they are able to fire the weapon without delay and with a great deal of certainty as to its effect.

The damage from a Timed Airburst follows standard rules for Airbursts.

"There's a surprise out there with your name on it. Your name is Claymore, isn't it?"

Sgt. Ingram



USSR M46 130mm Field Gun

Flechette Rounds

Also called the Beehive Round, the Flechette Round essentially transforms a 105mm Howitzer into a giant shotgun. The Flechette Round has a timed fuze and contains thousands of fin-stabilized darts. It is fired using normal Direct Fire rules at an attacking enemy, and like the Timed Airburst above, it must be pre-set for a particular Range.

The following table gives the Penetration (PEN), Damage Class (DC), Base Pellet Hit Chance (BPHC), and Pattern Radius (PR) for the Flechette Round.

"Of course I'm having a good time. I'm winning."

Gil the Treacherous

FLECHETTE ROUND DATA TABLE

	Direct Line Range from Burst in Hexes									
	1	2	3	4	6	8	10	12	15	20
PEN	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
DC	2	2	2	2	2	2	2	2	2	2
BPHC	*5	*1	51	28	12	06	04	02	01	00
PR	.3	.5	.8	1	2	2	3	3	4	5

The normal PC Shotgun rules are used to determine Odds of Hitting and Damage, with the following exceptions. To determine the Odds of Hitting, use a Target Size of 10 and the standard Direct Fire Odds of Hitting rules, assuming the Target is at 40 hexes. If the shot hits, the Range at which the round detonates is determined as given under Timed Airbursts above. All targets within the Pattern Radius are subject to being hit. If the shot misses, use the Shot Scatter rules for Timed Airbursts. When determining what area is covered by the Pattern, simply base the Pattern Radius in the hex where the shell detonates, and direct it in a straight line away from the weapon.

2.5

MUZZLE BLAST

The Muzzle Blast of an artillery piece can have a devastating effect on unprotected personnel in the vicinity of the weapon. This can be used for defensive purposes, but is just as dangerous to friendly soldiers who happen to be in the wrong place at the wrong time. The effects of a Muzzle Blast are as follows, and apply to all Artillery except Mortars and Rockets.

When an artillery piece fires, nearby personnel take a number of points of Physical Damage according to the following table, based on where they are relative to the Muzzle of the weapon.

MUZZLE BLAST TABLE

Angle from Line of Fire	Range from Muzzle in Hexes							
	0	1	2	3	4	5	10	15
0 - 60° Cone	450	120	40	20	10	8	3	1
60 - 120° Cone	330	90	30	15	8	6	2	
120 - 180° Cone	220	65	20	11	6	4	1	
Behind Muzzle	4							

Clearly, soldiers who are directly in front of the Muzzle are in more danger from the shock waves created by the firing of the piece than are those to the side, while personnel behind the Muzzle take relatively little damage. The GM should note that for almost all suitable artillery weapons, the Muzzle is more than one hex away from where the crew is stationed, due to barrel length, and they consequently take no damage.

For greater realism, players may take into account the different forces created by weapons of various calibers. The numbers given above apply to 105mm to 122mm caliber weapons. For 76mm to 90mm weapons, multiply the PD caused by the Muzzle Blast by

.5. For 130mm to 155mm weapons, multiply it by 3.0, and for 180mm to 203mm weapons, multiply it by 5.0.

2.6

STRUCTURES

This Section provides guidelines for the effects of Artillery on Buildings and Structures. These rules are used if a shell strikes a building or lands nearby. All Structures have a **Breech Value** and a **Collapse Value**, as given in the following table, and these Values are used to determine the exact effects of damage from a shell.

STRUCTURE BREECH AND COLLAPSE TABLE

Structure	Breech Value	Collapse Value
Thatch	300	150
Wood Frame	500	300
Mud Hut	800	350
Brick House	800	500
Brick Factory	1600	1000
Steel Frame High Rise	1300	2000
Concrete Commercial	5000	3000

"Multiple gunshot wounds. Numerous shell fragments. A deep bayonet wound. Let's call it Natural Causes."

Dr. Oscar Schneiderbunk

When a shell hits a wall, the size of the Breech it makes is determined by comparing the Base Concussion of the shell for a Burst on Rock at the Range from the wall, with the Breech Value of the wall. The referee should find the greatest Range at which the BC is greater than the Breech Value; all hexes of the wall within this distance are destroyed. If the BC at Range 0 is less than the Breech Value, then the wall is not breeched. For example, if a 105mm shell hits the wall of a Wood Frame house, the Breech will be 2 hexes across; the BC falls to 173 at a Range of 2 hexes, so the radius of the Breech is 1 hex and the total width is 2 hexes.

If the shell falls near a wall but does not hit it, then the size of the breech that is created is based on the shell's BC compared to 2 times the wall's Breech Value. Find all portions of the wall for which the BC is greater than 2 times the Breech Value; this entire area will be breeched.

To Collapse an entire building, rather than simply breaking a hole in one, the Collapse Value is used. Find the nearest load-bearing wall in the vicinity, and go to the point on that wall which is furthest from the place of the detonation. If the Base Concussion at that point is greater than or equal to the Collapse Value of the wall, then the entire wall Collapses. This brings down the roof and all internal non-load bearing walls which are not protected by an intact load-bearing wall. Players should refer to Section 2.8 to determine what happens to any inhabitants of the building.

2.7

FIELD FORTIFICATIONS

The most elementary defense against enemy attack in modern warfare is the Foxhole. When a Foxhole is expanded it becomes a Field Trench or a Slit Trench, but the concept remains the same; it is a hole to hide in. The protection offered by a Foxhole is obviously important against almost all attacks, but is perhaps most important against the incredible violence of an artillery attack. For the purposes of the following rules, a Field Trench is assumed to be about 4 feet wide and 7 feet deep, while Slit Trenches and Foxholes are 2 1/2 feet wide and 4 feet deep.

For obvious reasons, the effect of a Field Fortification is different against Ground Burst and Air Burst shells, each of which are discussed below. Additionally, the modifiers for Field Fortifications only apply to persons who are concealed within them; the only benefit received from standing in a Field Fortification with your head exposed is the Partial Cover Blast Modifier from PCCS, which is .5.

Ground Burst

When a shell Ground Bursts near soldiers in a Foxhole, the shrapnel and the concussion generally pass harmlessly over their heads. The Blast Modifier for the shell's Base Concussion is .01; the referee should multiply the shell's BC by .01 when determining the damage done to nearby troops.

The best chance that a Ground Burst explosion has of injuring personnel in Foxholes is of Collapsing the walls of their shelter. The Range at which a shell will Collapse a Foxhole or Trench is based on its **Collapse Radius** value; this is an indicator of how much of the Concussion will be forced through the earth. It is found in the right column of the Shell Burst Data Table.

"You have so many wood fragments in you, that I'm not going to remove them. I'll just sand you down."

Dr. Ezra Millstone

For example, if a US 105mm shell lands in the middle of a Trench network in the Sand, all Trenches within 4 hexes of the Impact Hex would immediately Collapse. Section 2.8 gives the effects of a Collapsing Fortification on the troops inside.

If a shell Ground Bursts in a hex with a Foxhole or Trench, the following guidelines should be used. The referee rolls a 00 to 99 number; on a roll of 00 to 14, the shell is actually in Contact with one of the inhabitants of the Fortification, if there are any. If there is more than one person in the Fortification, roll randomly to determine which is hit. On a roll of 15 to 54, the shell simply detonates within the Fortification. The Blast Modifier is X3, and all personnel are subject to the full Shrapnel Hit Chances without protection. On a roll of 55 to 99, the shell detonates in the hex outside the Fortification, and the normal Fortification rules apply.

Air Burst

A shell which Air Bursts above a Foxhole is far more effective than a Ground Burst, since much of the Concussion and Shrapnel is directed down into the Foxhole. The following table shows the effects of an Air Burst on Field Trenches and on Slit Trenches and Foxholes.

"In fact, you don't even need surgery. You need to be varnished."

Dr. Ezra Millstone

FIELD FORTIFICATION BLAST MODIFIERS

Range	Field Trench Blast Modifier	Slit Trench or Foxhole Blast Modifier
0	3.0*	3.0*
1	3.0*	2.3*
2	2.3*	.8
3	.7	.4
4	.5	.3
5	.4	.2
6 - 7	.3	.2
8 - 13	.2	.1
14 - 25	.1	.1
26 - 60	.05	.05
61+	.01	.01

Just enter the table with the Range from the Impact Hex to the Fortification, and find the Blast Modifier under the appropriate Fortification type. For the asterisked entries, there is no protection from Shrapnel; in all other cases, the personnel in the Fortifications are immune to Shrapnel.

Note that the table above already includes the normal PCCS modifiers for being behind solid cover and in a trench. These should not be applied a second time.

Bunkers

Bunkers are far more durable than Trenches and Foxholes, naturally, and provide the soldiers inside them with a greater degree of protection. Bunkers are immune to the effects of Airbursts, and the special rules above for direct hits with Ground Burst shells are also ignored. In addition, the Collapse Radius is modified as follows.

The normal Collapse Radius is used for standard Foxholes and the like, with little or no reinforcement. For Bunkers, the amount of reinforcement is represented by the **Bunker Value (BV)**. For heavy field fortifications made by hand, the BV would be 1 or 2; for normal Fire Base bunkers, the BV would be 3 to 5; and heavy bunkers designed to withstand sustained shelling would have BV's of 9 or more.

"Look on the bright side. Dying is the next best thing to living."

Sgt. Strict

To determine the effects of a burst on a Bunker, take the shell's Collapse Radius and subtract the distance to the Bunker from it. This is the **Collapse Potential (CP)**. If the CP is less than 1/2 of the BV, then the Bunker is undamaged. If the CP is less than the BV, but greater than or equal to 1/2 the BV, then the Bunker survives the impact, but has its BV reduced by 1. If the CP is greater than or equal to the BV, then the Bunker collapses.

Example:

A shell with a Collapse Radius of 4 lands 3 hexes from a Bunker with a BV of 4. The CP is 4 (Collapse Radius) - 3 (range to Bunker) = 1. This is less than 1/2 of the BV, so the Bunker takes no damage. A short time later, another shell lands 2 hexes from the Bunker. The CP is 4 - 2 = 2. This is 1/2 of the BV, so the Bunker is damaged, and its BV is lowered to 3. Another shell lands just 1 hex from the Bunker. Here the CP is 4 - 1 = 3. This is equal to the current BV, so the Bunker collapses. Note that if the BV had not been lowered from 4 to 3 by the second shell, then the third shell would not have collapsed the Bunker.

2.8 EFFECTS OF COLLAPSED FORTIFICATIONS

If a Foxhole, Trench, Bunker, or Building Collapses, the troops inside may be in greater danger from their own defenses than they were from the artillery shell. Each person in a Collapsed Bunker or Building must make two **Success Rolls**; one to avoid taking damage in the Collapse, and another to avoid being trapped in the wreckage. Those in Foxholes and Trenches are immune to damage, but must roll to avoid being trapped. Each time, the character rolls 3 six-sided dice, as described in **2nd Edition Advanced Phoenix Command**, adds them together, and compares the total to the Success Roll.

To avoid damage, the Success Roll is equal to 6 minus the Collapse Potential (CP), defined in the preceding section, minus the Bunker Value, and plus the character's Combat Skill Level. If the character rolls less than or equal to the Success Roll, he is safe. If the roll is higher than the Success Roll, then a 00 to 99 number is rolled and the following table is consulted to find the damage that has been taken.

"Why recover the bodies? Someone's just going to have to bury them again anyway."

Gil the Treacherous

COLLAPSED BUNKER DAMAGE TABLE

Roll	PD Taken
00 - 06	(1 - 10)
07 - 19	(1 - 10) x 10
20 - 79	(1 - 10) x 100
80 - 89	(1 - 10) x 1,000
90 - 99	(1 - 10) x 10,000

To avoid being trapped, the Success Roll is equal to 10 minus the Collapse Potential (CP) plus the character's Combat Skill Level. The character compares the die roll to this number; if it is less than or equal to the Success Roll, he has Succeeded; if it is greater, he has Failed.The character then rolls a second time, and if the result (Success or Failure) is the same as the first, he rolls a third time. He then checks his results against the following table to determine the situation of the character.

COLLAPSED FIELD FORTIFICATION ASPHYXIATION TABLE			
Roll Results	**Asphyxiation Modifier**	**Actions to Free Lungs**	**Actions to Escape**
Failed 3 Times in a Row	1	600	1200
Failed 2 Times in a Row	.5	300	900
Failed 1 Time Only	.25	100*	700*
Succeeded 1 Time Only	-	-	600*
Succeeded 2 Times in a Row	-	-	200*
Succeeded 3 Times in a Row	-	-	10*

"Why recover the body? I cleaned him out in the poker game last night."

Gil the Treacherous

The **Asphyxiation Modifier** is applied to the elapsed time when determining damage taken from Asphyxiation, which is naturally one of the first side effects of burying someone under several feet of earth, sandbags, and timber. For those using the rules in Section 4.3 of the **Special Weapons Weapon Data Supplement**, the character is assumed to be in a Strangle Hold for purposes of taking Shock Points and Physical Damage. The Asphyxiation Modifier above should be applied to the Asphyxiation Time; for example, if the character Failed only 1 roll and has been buried for 40 Phases, the effective Asphyxiation Time would be equal to 40 divided by 4, or 10 Phases. For those who do not have those rules, assume that a character is Incapacitated after 30 Phases for those who have Failed 3 Times, 60 Phases for those who Failed twice, and 120 Phases for those who Failed only once.

The other two columns indicate the amount of time it will take to dig a character out of a Collapsed Fortification. This is the total number of Actions necessary, and the troops doing the digging are assumed to be exposed and In The Open for purposes of incoming fire. The asterisks in these entries indicate that the trapped character can use his own Actions to free himself. For entries without asterisks, the character is pinned and cannot use any Actions.

Note that once a Bunker Collapses, it is treated as an open trench for all further fire.

2.9

TREES AND JUNGLE

"Don't look at me. He wasn't squished like a bug the last time I saw him."

Axly

When Artillery is fired into wooded areas, the density of the cover can reduce the effects of the rounds and the trees can even set them off prematurely, resulting in an Air Burst. The effects for Direct Fire and Indirect Fire are different, and use the following rules.

Note that these rules apply only to shells with normal **Point Detonating Quick Fuzes**, which comprise the majority of Artillery shells. Shells with Delay or Armor Piercing Fuzes are not subject to premature detonation, and will detonate normally. **Delay Fuze** data is given for two shells in the **Burst Data Tables**; the US 81mm Mortar and 105mm rounds, both of which were commonly fired with Delay Fuzes in Vietnam. **Armor Piercing** rounds, listed as **APC** in the **Direct Fire Data Tables**, have a small explosive charge that is roughly equivalent to a grenade, and have therefore been left out of the Burst Data Tables. In the rare event that the explosive charge of an APC round is considered important, the explosion can be modelled by using the effects of a Belgian NR446 Blast Grenade from PCCS.

Indirect Fire

Shells which use Quick Fuzes are likely to detonate prematurely when falling into Wooded or Jungle areas. The chances and effects of a **Premature Detonation** are given in the following table, based on the density of the area. Any Premature Detonation is treated as an Air Burst.

INDIRECT FIRE PREMATURE DETONATION		
Terrain Type	**Blast Modifier**	**% Chance of Premature Detonation**
Woods - Light	1	04
Medium	1	08
Heavy	.9	20
Jungle	.9	08
Triple Canopy	.7	29

The referee should roll a 00 to 99 number for any Quick Fuze shell which falls into any area which matches one of the above descriptions; if the number rolled is less than or equal to the number on the table, the shell has a Premature Detonation and is treated as an Airburst. The Blast Modifier shown shown on the table is applied to the shell's Base Concussion.

Note that shells which detonate prematurely do not have any chance of penetrating targets in the hex.

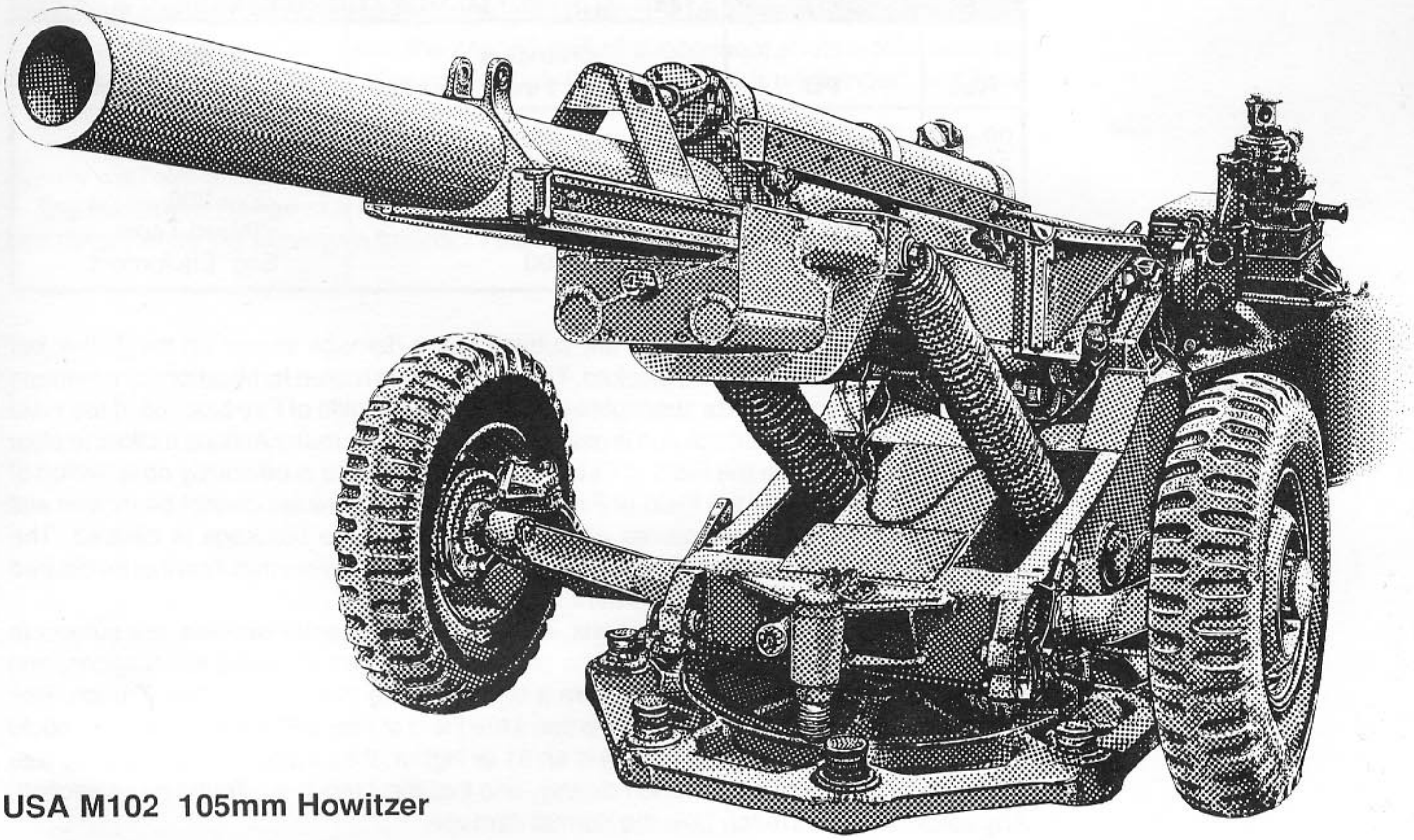
"Sorry, Captain, but it sure didn't look like a friendly aircraft from here."

Schnurda

Direct Fire

When Artillery Direct Fire goes into wooded areas, there is a chance that the shell will make a solid contact with a tree trunk or limb and will detonate. If this happens, the shell is considered to be an Airburst, and normal Airburst rules are used to determine the effects of the blast.

To determine the maximum distance a shell penetrates into a wooded area before detonation, roll a 00 to 99 number and enter the table on the following page, using the line for the appropriate terrain type.



USA M102 105mm Howitzer

DIRECT FIRE PREMATURE DETONATION										
	Direct Fire Penetration - Number of Hexes									
Terrain Type	1	3	5	10	20	40	60	80	100	140
Woods - Light	97	93	90	82	67	45	31	21	14	06
Medium	95	88	82	67	45	21	09	04	01	00
Heavy	90	74	61	37	14	01	-	-	-	-
Brush - Light	99	97	96	92	86	74	65	56	49	36
Medium	97	94	90	82	68	47	32	22	15	07
Heavy	96	90	85	73	53	29	15	08	04	01
Jungle	93	84	75	55	31	10	02	00	-	-
Triple Canopy	86	70	55	31	09	00	-	-	-	-

On the appropriate line, find the column which has the largest number that is less than or equal to the number rolled. This is the maximum number of wooded hexes that the shell will penetrate before detonating. If the Impact Hex is within that number of hexes, then fire is executed normally. If the Impact Hex is deeper inside the woods than the given number of hexes, the shell will detonate as an Airburst when it reaches the number of hexes indicated.

"Fine, shoot off my other leg. See if I care."

Ridan

When a round suffers Premature Detonation, there is a chance that branches and other large debris from the tree which has been hit will endanger nearby troops. Multiply the Shell's Collapse Radius in Earth by 10%; this is the chance that the debris has damaged or blocked the view of nearby personnel. Roll a 00 to 99 number for each person and each piece of equipment in the hex with the detonation, or in an adjacent hex. Each time the number is less than or equal to 10% times the Collapse Radius, the following table should be consulted.

FALLING TREE DAMAGE TABLE			
Roll	PD	Chance a 60° Field of Fire is Blocked	Actions to Clear a 60° Field of Fire
00 - 30	0	20	20
31 - 60	0	60	100
61 - 80	(1 - 10)	70	200
81 - 93	(1 - 10) x 100	80	*Need Tools
94 - 99	(1 - 10) x 1,000	90	*Eng. Equipment

Personnel who are in the open are subject to the damage shown on the Table, but cannot have their Fields of Fire blocked. Those who are in roofed fortifications are immune to Physical Damage, but are susceptible to having their Fields of Fire blocked. If the Field of Fire is blocked, the third column is used to determine how many Actions it takes to clear the branches and open the Field of Fire. For equipment there is obviously no question of Physical Damage, but if the Field of Fire is blocked, then vehicles cannot be moved and weapons such are artillery pieces cannot be fired until the blockage is cleared. The asterisks in the third column indicate that the blockage is so severe that it cannot be cleared without tools or engineering equipment.

Troops who are in open fortifications, such as Trenches and Foxholes, are subject to having their Fields of Fire blocked in the same way as those in roofed fortifications, and are also in limited physical danger from a branch falling directly into their Trench. Roll normally on the Falling Branch Table to see if the Field of Fire is Blocked. If damage could be taken on that roll; that is, if the roll is an 81 or higher, then there is a 10% chance that the branch has entered the Trench cleanly, and that the Trench is offering no protection. Any soldiers in the Trench take the normal damage.

RIFLE GRENADES

The Direct Fire use of **Rifle Grenades** is discussed in Section 2.1 of the **Phoenix Command Special Weapons Weapon Data Supplement**, and full information about how Rifle Grenades work is presented there. Rules for using Rifle Grenades as Indirect Fire weapons are as follows.

Rifle Grenades use the same Indirect Fire rules as Artillery for Shell Placement. Unlike Artillery, however, a Rifle Grenade does not have a carriage, so the second and all additional shots are little more accurate than the first, and the shooter's experience with this unusual function is vital. Consequently, Indirect Fire of a Rifle Grenade is a Skill, like Gun Combat. To determine a soldier's Accuracy, use the following **Rifle Grenade Accuracy Table**.

RIFLE GRENADE SHELL ACCURACY TABLE

Rifle Grenade Indirect Fire Skill Level	Shell Accuracy	Rifle Grenade Indirect Fire Skill Level	Shell Accuracy
0	84	5	18
1	42	6	16
2	33	7	14
3	24	8	12
4	21	9+	9

"Don't make me blow you up."

Kyle the Walking Claymore

This Accuracy should be used in the normal way when determining the initial Shell Placement Hex. For the second and all subsequent shots, however, the shot should be run with 1 added to the Rifle Grenade Indirect Fire Skill Level of the shooter. For example, if a shooter is 0th Level Rifle Grenade Indirect Fire, the first shot to a given location would be with an Accuracy of 84 hexes; the second and all subsequent shots would have an Accuracy of 42 hexes. This modifier applies only if the target hex is unchanged, and if the shooter does not move.

Note that most soldiers have little experience with firing Rifle Grenades, and consequently will have an Rifle Grenade Indirect Fire Skill Level of 0.

The **Maximum Range** of a Rifle Grenade for Indirect Fire is 4 times the normal Direct Fire range, while the **Minimum Indirect Fire Range** is equal to the Direct Fire Range.

3

WEAPON DATA

This Chapter contains the Weapon Data for a wide range of Artillery pieces from World War II through the present. Some of the values are also used in PCCS, while others are unique to the Artillery System.

The tables are in four Sections: Weapon Data, Direct Fire Performance, Burst Performance, and Incendiary Data. Each is discussed below.

3.1

WEAPON DATA

The **Weapon Data Table** shows the basic Physical, Direct Fire, and Indirect Fire characteristics of each of the weapons. Both the Artillery and Mortar Data Tables have the same terms, which are defined below.

Length

For most artillery pieces, this is the overall length in feet of the weapon when it is prepared for movement. For mortars, this is the overall length in inches.

Weight

The weapon's weight in pounds, when it is ready for transportation. This does not include ammunition.

Rate of Fire (ROF)

The number of rounds which can be fired from the weapon each minute, or the number of Phases it takes to reload and fire a round. There are three different Rate of Fire values listed for various weapons; Burst ROF, Short Term ROF, and Sustained ROF.

"Yes, I was aiming at him, but I've never hit anything with a rocket launcher before, so I didn't think it mattered."

Axly

The **Burst ROF** is for modern weapons with automatic loading devices, and generally applies to three rounds fired in rapid succession. Except for Clip-fed weapons, it is not possible to use the Burst ROF with more than three rounds, as the rounds must be prepared and carefully placed for Burst use. For weapons which use a Clip of ammunition, the entire contents of the Clip may be fired using the Burst ROF before reloading.

Short Term ROF is the ROF which the Crew can maintain for a period of a few minutes. The rounds must be prepared in advance and be placed properly in the gun pit.

Sustained ROF is the ROF which the Crew can maintain for longer periods.

Shell Weight

The weight in pounds of the projectile.

Crew

The number of people normally attending the weapon.

Elevation

The angles to which the weapon's barrel can be elevated, with 0 degrees being horizontal. Negative values indicate the maximum depression of the weapon's barrel, or how low it can point.

Traverse

This is the angle over which the weapon's barrel can be moved without having to Reposition the gun.

Deploy Time

The time, in Phases, needed to deploy and set up a gun as part of a battery, including leveling, placing azimuth stakes, and establishing the fire control devices such as radios, computers, and so forth.

If the weapon is to be set up for Direct Fire only, use 1/2 this time.

"All's Well That Aims Well."

Neemis Enterprises
Quality Assurance Slogan

USA M29A1 81mm Mortar

Reposition Time

This is the number of Phases needed to get the gun set up for rotation in its gun pit. Generally, a special device called a Firing Jack is used to lift the weapon and allow it to be pivoted to a new angle. Once the weapon has been rotated, it must be dropped off the Firing Jack and prepared for fire, which includes setting the weapon's tail to handle the recoil, adjusting the levelling, and so forth.

Range

The Minimum and Maximum ranges at which the weapon can be fired, in hexes.

"Hand me my Melon Baller. This man is full of Shrapnel."

Dr. Oscar Schneiderbunk

Ranging Accuracy

This is the base Scatter Radius in hexes for the first shot in a Fire Mission, based on the inaccuracies of the weapon, fire control, and other effects.

Adjusted Fire Accuracy

The Scatter Radius in hexes for all Adjustment shots in a Fire Mission, when corrections are called for by the Forward Observer.

Shell Accuracy

The Scatter Radius in hexes for shells fired during the Fire for Effect portion of a Fire Mission.

Shell Index

This gives the shells which may be fired by the weapon. The numbers listed here are the **Shell Numbers** from the **Burst Data Tables**; for example, 1 refers to the 76mm HE artillery shell produced by the USSR. Mortar shells have their own Burst Data Tables.

The **Smoke** entries indicate the Smk and Dur values for White Phosphorus rounds fired by the weapon. These values are fully explained in **Advanced Phoenix Command** and in the **Special Weapons Weapon Data Supplement**.

3.2

DIRECT FIRE PERFORMANCE

The data for shells fired in the Direct Fire mode is found on this half of the Artillery Data Table. The values are generally those used in PCCS, and are defined below.

Aim Time Modifiers

The weapon's Aim Time Modifiers for Direct Fire accuracy. These are used in the same manner as the Aim Time Mods in PCCS. The Minimum Aim Time here is 4 Actions, and Aim Time does not begin until the weapon has been positioned for fire.

Shell Type

Located at the left of the Direct Fire Data Tables, the Shell Type is an indicator of the type of round being fired. **HE** stands for High Explosive, **HEAT** is High Explosive Anti-Tank, and **APC** is Armor Piercing Capped. APC rounds have a small explosive charge that is roughly equivalent to a grenade, and have therefore been left out of the Burst Data Tables. In the rare event that the explosive charge of an APC round is considered important, the explosion can be modelled by using the effects of a Belgian NR446 Blast Grenade from PCCS.

Penetration (PEN)

This is the maximum armor which the shell can penetrate. Although much of the round has not penetrated the armor at the time of detonation in this case, the explosive effects are generally sufficient to disable the target. This value is used extensively in the **Mechanized Combat System**.

Full Penetration (PENF)

This is the amount of armor which the shell can completely penetrate. This means that on detonation, the entire shell is through the armor. This is used in the **Mechanized Combat System**.

Angle of Incidence (AOI)
This is the angle at which the projectile strikes its target, and is used in the **Mechanized Combat System**.

Non-Penetrating Impact Damage (NID)
This is the Impact Damage delivered to a target if the round fails to penetrate the target's armor, and is used in the **Mechanized Combat System**. For powerful modern rounds, this is often enough to disable a vehicle even without penetration.

Direct Fire Error (DFE)
This measures the shot scatter when the weapon is used in the Direct Fire mode.

Ballistic Accuracy (BA)
This is a measure of the weapon's accuracy potential. The larger the BA, the greater the potential. This value is used in the **Advanced Phoenix Command** supplement and in the **Mechanized Combat System**.

Time of Flight (TOF)
The projectile's time of flight in tenths of seconds. This is also used in the **Advanced Phoenix Command** supplement and in the **Mechanized Combat System**.

3.3

SHELL BURST DATA

The shell burst and shrapnel data are contained in this table, and are defined below.

Shell Number
At the upper left corner of each page is the Shell Number, which is used with the Shell Index to determine which Shells can be fired by various weapons.

Shell Description
Adjacent to each Shell Number is the Shell Description, which lists the caliber, type, and nationality of the round, as well as any other pertinent information.

Burst Condition
Each table is divided into five sections; either Airburst, or Ground Burst on Earth, in Rock, in Sand or Ice, and in a Flooded Rice Paddy or other shallow water. This is done because, unlike a grenade burst, artillery and mortar shells often penetrate the earth before detonating, and this can result in large amounts of thrown debris being added to the shrapnel. To accurately model this, each shell's Burst Data is shown for detonation in various conditions.

"If all of your friends threw themselves on grenades, would you do it too?"

Sgt. Servo

Shrapnel
The top portion of each Burst Condition is given over to the Shrapnel effects of the round. If a Shrapnel hit is indicated, then a 0 to 9 number is rolled and this portion of the table is consulted. The roll determines how large a piece of Shrapnel has hit the target; on a 0 to 6, the top lines are used, on a 7 or 8 the middle lines apply, and on a 9 the bottom lines are used. Find the PEN and DC for the Shrapnel at the appropriate Range. Damage done by a piece of Shrapnel is handled exactly as normal small arms fire. The Shrapnel sizes model the fact that most artillery shells are not fitted with a Fragmentation Sleeve like that on a grenade, which would result in uniform pieces of Shrapnel. Without the Sleeve, the artillery shell breaks into an irregular number of fragments, which range in size from metal dust to large chunks weighing many ounces.

Base Shrapnel Hit Chance (BSHC)
This is the chance that a piece of Shrapnel has hit each target beyond Critical Range, and is used in the same way as the BSHC in PCCS.

Base Shrapnel Hit Chance, Critical Range (BSCC)
Exactly as the BSHC, except that it applies to targets within Critical Range.

Base Concussion (BC)

The Base Concussion generated by the explosion of the round, at various ranges. This is used in the same way as the BC in PCCS.

Fragments

In some cases, the bottom portion of each section is given over to the necessary data for Fragments of wood or rock generated by the burst. Airbursts can generate wood fragments when they detonate in wooded or jungle hexes; Ground Bursts generate rock fragments when they detonate in Earth or Rock. A 0 to 9 number is rolled, as above, to determine the type of fragment generated. The **Impact Damage (ID)** done by this Fragment is given for each Range, along with the BSCC. Note that these Fragments are only dangerous within the **Critical Range**.

"Of course they're loyal to me. I have the best troops money can buy."

Corley Norris

Penetration Data

In the top block of the right column is the Penetration Data of the Shell, in the event that it scores a direct hit on an armored target. The PEN and PENF numbers are used in exactly the same way as those given in the **Direct Fire Tables**.

Also included in this block is the Base Concussion (BC) of the round in direct contact with a target.

Critical Range Data

These are the Critical Ranges for targets in various stances, and determine whether the BSHC or the BSCC is used to find the chance of Shrapnel hitting a target.

Collapse Radius

This is the radius within which all Trenches and Walls will collapse, and is also used in conjunction with the Bunker Value to find if a Bunker collapses. It is noticeably higher in areas with soft ground, such as rice paddies, reflecting the weaker nature of fortifications built out of weak materials. If a solid, well-constructed fortification is constructed in an area surrounded by soft ground, the lower Collapse Radius of the two values is used.

3.4

INCENDIARY DATA

The necessary data for Incendiary and White Phosphorus shells is contained in this table. This data is used in conjunction with the Incendiary rules of Section 1.1 in the **Phoenix Command Special Weapons WDS**. The terms are defined below.

"I Didn't Get Through, But I Died Way Cool."

Ridan
His Epitaph

Base White Phosphorus Hit Chance (BWPHC)

This is the base chance of hitting a target with a White Phosphorus Fragment. This Hit Chance is similar to the Base Shrapnel Hit Chance.

Physical Damage for Body and Limbs (PD Body, PD Limbs)

The damage caused by a WP Fragment.

Physical Damage Surface Burns at Target Size 0, 4, and 7 (PDs TS 0, 4, 7)

The Physical Damage caused by the small particles of WP which saturate the burst area.

FORWARD OBSERVER POSITION ERROR TABLE

Forward Observer Skill Level	Calculated Target Position Error	Spotted Target Position Error	Plot Time (Actions)
0	900	80	900
1	600	50	600
2	400	35	400
3	300	25	300
4	240	20	240
5	200	17	200
6	190	16	190
7	180	15	180
8	170	14	170

"Oops! Adjustment Fire, 1000 Meters Left... No, no, the other Left!"

Axly
Forward Observer for a Day

FIRE MISSION TIME TABLE

Fire Mission Speed	Fire Supplied By Artillery Fire Base	Fire Supplied By Company Level Fire Support	Fire Mission Speed	Fire Supplied By Artillery Fire Base	Fire Supplied By Company Level Fire Support
1	650	200	11	190	64
2	560	170	12	170	60
3	480	150	13	160	58
4	420	130	14	150	56
5	380	120	15	140	54
6	340	110	16	130	52
7	300	100	17	120	50
8	260	90	18	110	48
9	230	80	19	100	44
10	210	70	20+	90	40

SCATTER VALUE

Roll	Scatter Value	Roll	Scatter Value	Roll	Scatter Value
00 - 01	.01	29 - 37	.20	79 - 86	.60
02 - 03	.02	38 - 46	.25	87 - 91	.70
04 - 09	.05	47 - 54	.30	92 - 94	.80
10 - 19	.10	55 - 67	.40	95 - 97	.90
20 - 28	.15	68 - 78	.50	98 - 99	1.00

BLUNT IMPACT DAMAGE TABLE

		Impact Damage										
Rigid Armor		11	22	24	31	40	44	53	62	73	84	99
Flex Armor		4	7	8	11	15	17	20	24	28	32	39
No Armor		1	2	3	4	5	6	7	8	10	12	14
00-05	Head	1	2	4	34	2H	4H	7H	1K	2K	4K	6K
06-48	Body	1	2	3	6	11	18	27	37	61	1H	2H
49-99	Limb	1	1	2	4	8	15	19	23	43	72	1H

SCATTER ANGLE

Percentile Die Roll	Scatter Angle
00 - 07	0°
08 - 16	30°
17 - 24	60°
25 - 32	90°
33 - 41	120°
42 - 49	150°
50 - 57	180°
58 - 66	210°
67 - 74	240°
75 - 82	270°
83 - 91	300°
92 - 99	330°

12 - Sided Die Roll	Scatter Angle
1	0°
2	30°
3	60°
4	90°
5	120°
6	150°
7	180°
8	210°
9	240°
10	270°
11	300°
12	330°

MORTAR DATA TABLE

Mortar	Physical Data	Gun Handling	Indirect Fire	Shell Index
Type V Commando 60mm France This is a light Brandt mortar which can be fired by one man. It has no bipod and is little more than a tube with an elevation sight. The range is dialed into the sight and the tube elevated until a bubble is levelled in the sight. Azimuth is controlled by lining up a mark on the lip of the tube.	Length 26.8 Weight 17.0 Burst ROF 2p Short Term ROF 3p Sustained ROF 10p Shell Weight 3.2	Elevation - Traverse - Deploy Time 4p Reposition Time 2p Crew 1 Target Size 0	Range Maximum 570 Minimum 55 Accuracy Treat this mortar as a rifle grenade launcher for accuracy.	HE 1 WP 1 Smoke Smk 3 Dur 3
MO-60-63 Brandt 60mm France This light conventional mortar was developed in the 1960's and is still in production. It is in service with the French Army and is also widely exported. Data is for use with US 60mm bombs.	Length 28.5 Weight 32.6 Burst ROF 1p Short Term ROF 2p Sustained ROF 4p Shell Weight 3.2	Elevation 40 - 60° Traverse 17° Deploy Time 35p Reposition Time 6p Crew 3 Target Size 0	Range Maximum 1120 Minimum 55 Accuracy Ranging Fire 42 Adjustment Fire 37 Shell Accuracy 33	HE 1 WP 1 Smoke Smk 3 Dur 3
81mm Long Range 81mm France The Long Range mortar was designed to match the range of the vehicular mortar cannon and approach the range of the 120mm mortar. It is of conventional design and can be broken down into three loads.	Length 66.9 Weight 190 Burst ROF 1p Short Term ROF 3p Sustained ROF 6p Shell Weight 9.4	Elevation 30 - 85° Traverse 29° Deploy Time 45p Reposition Time 12p Crew 3 Target Size 5	Range Maximum 3170 Minimum 90 Accuracy Ranging Fire 135 Adjustment Fire 115 Shell Accuracy 100	HE 2 3 WP 2 Smoke Smk 5 Dur 3
MO-120-60 Brandt 120mm France A simple, reliable, smooth bore mortar of conventional design, it has been designed for mobility and speed. It can be brought into action and operated by as few as three men. Normally the baseplate is set by firing a "bedding in" round at an elevation of 60° or greater.	Length 64.2 Weight 207 Burst ROF - Short Term ROF 2p Sustained ROF 4p Shell Weight 28.7	Elevation 40 - 85° Traverse 10° Deploy Time 45p Reposition Time 12p Crew 3 Target Size 7	Range Maximum 3610 Minimum 330 Accuracy Ranging Fire 150 Adjustment Fire 115 Shell Accuracy 100	HE 7 WP 4 Smoke Smk 10 Dur 4
SGr-34 80mm Germany The Schwerer Granatenwerfer 34 was the standard heavy infantry mortar of the German Army in the Second World War. Burst data is similar to the Soviet 82mm mortar.	Length 45.0 Weight 137 Burst ROF 1p Short Term ROF 2p Sustained ROF 6p Shell Weight 7.7	Elevation 45 - 85° Traverse 6° Deploy Time 40p Reposition Time 12p Crew 3 Target Size 5	Range Maximum 1300 Minimum 35 Accuracy Ranging Fire 47 Adjustment Fire 44 Shell Accuracy 43	HE 4 WP 2 Smoke Smk 5 Dur 3
M-37 82mm USSR This mortar is nearly identical to the M-36, which was the first Soviet 82mm mortar. The design of the M-37 has become a standard; it served throughout the Second World War and is still in service. Ammunition for these mortars has not changed since their introduction in 1936.	Length 48.0 Weight 123 Burst ROF 1p Short Term ROF 2p Sustained ROF 8p Shell Weight 7.1	Elevation 45 - 85° Traverse 6° Deploy Time 45p Reposition Time 12p Crew 3 Target Size 4	Range Maximum 1640 Minimum 55 Accuracy Ranging Fire 54 Adjustment Fire 51 Shell Accuracy 48	HE 4 WP 2 Smoke Smk 5 Dur 3
Vasilyek 2B9 82mm USSR The Vasilyek is an 82mm automatic mortar which has a two wheeled carriage similar to the 76mm Mountain Gun. It fires four round clips at rates as high as 2 rounds per second, and can be direct fired. Towed versions are issued 6 per motorized rifle battalion. Weight and length data are estimates.	Length 132 Weight 1500 Capacity 4 Reload Time 1p Rate of Fire 4rnd / p Shell Weight 7.1	Elevation 0 - 80° Traverse 10° Deploy Time 50p Reposition Time 20p Crew 3 Target Size 8	Range Maximum 2730 Accuracy Ranging Fire 122 Adjustment Fire 107 Shell Accuracy 96	HE 4 WP 2 Smoke Smk 5 Dur 3
M-38 107mm USSR The M-38 was produced for mountain divisions and for animal transport, and is a reduced version of the 120mm mortar. This weapon was used in the Second World War and the current version, the M-107, is of similar design. Ammunition has not changed since its introduction.	Length 65.7 Weight 750 Burst ROF 2p Short Term ROF 4p Sustained ROF 10p Shell Weight 20.1	Elevation 45 - 80° Traverse 3° Deploy Time 60p Reposition Time 16p Crew 6 Target Size 6	Range Maximum 2820 Minimum 270 Accuracy Ranging Fire 100 Adjustment Fire 90 Shell Accuracy 85	HE 5 WP 3 Smoke Smk 10 Dur 4

MORTAR DATA TABLE

Mortar	Physical Data	Gun Handling	Indirect Fire	Shell Index
M-43 120mm USSR The M-43 is almost identical to the M-38 which was used throughout the Second World War. These mortars are no longer in production but are still in service, six being attached to each motorized rifle division. During World War II, the 120mm mortar was usually found in divisional artillery.	Length 73.0 Weight 1100 Burst ROF 2p Short Term ROF 3p Sustained ROF 10p Shell Weight 35.3	Elevation 45 - 80° Traverse 8° Deploy Time 70p Reposition Time 20p Crew 6 Target Size 7	Range Maximum 3120 Minimum 250 Accuracy Ranging Fire 103 Adjustment Fire 94 Shell Accuracy 87	HE 7 WP 4 Smoke Smk 10 Dur 4
M-160 160mm USSR The Soviet Army introduced the 160mm mortar in 1943 and continues to use them in divisional mortar units of mountain divisions. The M-160 is the current version and is nearly identical to the M-43 used in World War II. It is a breech loading mortar whose barrel pivots about a trunnion on the mounting base.	Length 179 Weight 3240 Burst ROF 10p Short Term ROF 15p Sustained ROF 30p Shell Weight 88.2	Elevation 50 - 80° Traverse 24° Deploy Time 120p Reposition Time 50p Crew 7 Target Size 13	Range Maximum 4400 Minimum 410 Accuracy Ranging Fire 136 Adjustment Fire 128 Shell Accuracy 123	HE 8 WP - Smoke Smk - Dur -
M-240 240mm USSR The M-240 heavy mortar was deployed in the mid-1950's in heavy artillery brigades. It is used for demolition of buildings and fortifications and is especially useful in towns and urban areas where its high angle of fire can hit where conventional artillery cannot. The weapon is breech loaded.	Length 210 Weight 9200 Burst ROF 15p Short Term ROF 30p Sustained ROF 60p Shell Weight 286.6	Elevation 45 - 65° Traverse 18° Deploy Time 750p Reposition Time 600p Crew 9 Target Size 15	Range Maximum 5300 Minimum 440 Accuracy Ranging Fire 164 Adjustment Fire 154 Shell Accuracy 148	HE 9 WP - Smoke Smk - Dur -
L16ML 81mm UK This 81mm mortar has been designed for use primarily from fixed positions, but it can be broken down into three manloads or transported by light vehicles, such as jeeps. Like all 81mm mortars, it is a little heavy for field infantry, but it is an accurate and reliable weapon for support of a fire base or Fighting Vehicle.	Length 50.4 Weight 80.9 Burst ROF 1p Short Term ROF 2p Sustained ROF 6p Shell Weight 9.9	Elevation 45 - 80° Traverse 11° Deploy Time 41p Reposition Time 11p Crew 3 Target Size 4	Range Maximum 3090 Minimum 100 Accuracy Ranging Fire 108 Adjustment Fire 90 Shell Accuracy 77	HE 2 3 WP 2 Smoke Smk 5 Dur 3
M-19 60mm USA The M-19 is of standard design and is similar to the M1 and M2 mortars used in World War II. It is a light weight company mortar that can be handled by field infantry. It was used throughout the Vietnam conflict and has only recently been placed in reserve. The M19 is being replaced by the new M224.	Length 32.2 Weight 46.4 Burst ROF 1p Short Term ROF 2p Sustained ROF 4p Shell Weight 3.2	Elevation 40 - 85° Traverse 14° Deploy Time 36p Reposition Time 10p Crew 2 Target Size 2	Range Maximum 990 Minimum 25 Accuracy Ranging Fire 32 Adjustment Fire 29 Shell Accuracy 27	HE 1 WP 1 Smoke Smk 3 Dur 3
M29A1 81mm USA The M29A1 is a conventional mortar almost identical to the M1 81mm mortar used in World War II. The 81mm was a common fire base support weapon and was used throughout the Vietnam conflict. Today there are plans for replacing it with a modern design, but it is still in production and is found throughout the world.	Length 51.0 Weight 96.8 Burst ROF 1p Short Term ROF 2p Sustained ROF 6p Shell Weight 9.4	Elevation 45 - 84° Traverse 11° Deploy Time 43p Reposition Time 11p Crew 3 Target Size 5	Range Maximum 2180 Minimum 25 Accuracy Ranging Fire 65 Adjustment Fire 59 Shell Accuracy 55	HE 2 3 WP 2 Smoke Smk 5 Dur 3
M30 107mm USA The M30 107mm mortar fires a spin stabilized round. It has a rifled barrel and is drop fired. It can be disassembled and carried in five manloads, but is primarily vehicle mounted or found in fixed fire bases. It is the largest mortar in the US inventory and has excellent accuracy due to its spin stabilization.	Length 60 Weight 672 Burst ROF 2p Short Term ROF 3p Sustained ROF 10p Shell Weight 27.0	Elevation 40 - 65° Traverse 14° Deploy Time 80p Reposition Time 30p Crew 5 Target Size 6	Range Maximum 3090 Minimum 500 Accuracy Ranging Fire 50 Adjustment Fire 42 Shell Accuracy 40	HE 6 WP 3 Smoke Smk 10 Dur 4
RPU-14 140mm Multiple Rocket USSR The RPU-14 140mm multiple rocket launcher is a towed 16 round rocket launcher designed for Soviet airborne divisions. There are 18 in the artillery regiment of each Airborne Assault Division, and the rockets are spin stabilized. There is also a single round 140mm launcher available for use by guerrilla or special forces.	Length 159 Weight 4045 Capacity 16 Reload Time 100p Rate of Fire 4rnd/p Shell Weight 87.3	Elevation 0 - 48° Traverse 30° Deploy Time 50p Reposition Time 30p Crew 5 Target Size 14	Range Maximum 5360 Minimum 220 Accuracy Ranging Fire 133 Adjustment Fire 108 Shell Accuracy 100	HE 10 WP - Smoke Smk - Dur -

ARTILLERY DATA TABLE

Artillery	Physical Data	Gun Handling	Indirect Fire	Shell Index
Type 54 - 1 122mm Howitzer China The Type 54 - 1 is virtually identical to the Soviet M30 Howitzer of the same caliber. It uses a variable propellant charge system, fires from its road wheels, and is of standard split trail design.	Towed Length 19.4 Weight 5511 Crew 8 Gunshield PF 30 Burst ROF - Short Term ROF 5p Sustained ROF 15p Shell Weight 48.0	Elevation +60.5 / -3° Traverse 49° Deploy Time 45p Reposition Time 50p Target Size Front 14 Front fire over 10 Side 14 Side fire over 12	Range Maximum 6450 Accuracy Ranging Fire 45 Adjustment Fire 35 Shell Accuracy 27	HE 6 AP - WP 6 Smoke Smk 12 Dur 4
Type 59 - 1 130mm Field Gun China This field gun is similar to the Soviet M46. The Type 59 - 1 is a new model 130mm gun which combines designs from the prior Type 59 and Type 60 122mm gun. It is in service in China, North Korea, Vietnam, Africa, and the Middle East.	Towed Length 35.4 Weight 13890 Crew 8 Gunshield PF 30 Burst ROF - Short Term ROF 4p Sustained ROF 15p Shell Weight 71.5	Elevation +45 / -2.5° Traverse 58° Deploy Time 51p Reposition Time 65p Target Size Front 13 Front fire over 9 Side 16 Side fire over 14	Range Maximum 15030 Accuracy Ranging Fire 94 Adjustment Fire 72 Shell Accuracy 56	HE 8 AP - WP 7 Smoke Smk 13 Dur 4
Type 66 152mm Gun-Howitzer China The Type 66 is a Chinese version of the Soviet D20. The designs are almost identical and it is normally towed by a 6x6 truck. The Type 66 fires from its road wheels and is in service in China, North Korea, Vietnam, and Africa.	Towed Length 28.5 Weight 12610 Crew 10 Gunshield PF 30 Burst ROF - Short Term ROF 4p Sustained ROF 15p Shell Weight 96.0	Elevation +45 / -5° Traverse 58° Deploy Time 50p Reposition Time 62p Target Size Front 16 Front fire over 12 Side 16 Side fire over 13	Range Maximum 9420 Accuracy Ranging Fire 69 Adjustment Fire 52 Shell Accuracy 40	HE 9 AP - WP 8 Smoke Smk 15 Dur 5
Model 50 155mm Howitzer France The Model 50 was developed in France following the Second World War and was widely used by the Israeli, Swedish, and other armies. Currently it is being replaced in France by the new 155mm TR. In Israel it has been largely replaced by self propelled artillery, but a number of weapons are still in service. Many of these weapons were also captured by the Israeli Army after the invasion of Lebanon in 1982.	Towed Length 25.6 Weight 19840 Crew 11 Gunshield PF - Burst ROF - Short Term ROF 7p Sustained ROF 15p Shell Weight 94.8	Elevation +69 / -4° Traverse 80° Deploy Time 68p Reposition Time 60p Target Size Front 13 Front fire over 7 Side 16 Side fire over 14	Range Maximum 9840 Accuracy Ranging Fire 81 Adjustment Fire 62 Shell Accuracy 49	HE 12 AP - WP 8 Smoke Smk 15 Dur 5
155mm TR 155mm Towed Gun France The TR is replacing the Model 50 and has been designed for use by French Motorized Infantry Divisions. The gun has an Auxilliary Power Unit (APU) which provides hydraulic power for repositioning and laying of the gun as well as reloading. The APU provides drive to the road wheels, and the gun can move under its own power at speeds of 8 km/hr. The hydraulic shell ramming system allows rates of fire as high as three rounds in 18 seconds.	Towed Length 28.7 Weight 23480 Crew 8 Gunshield PF - Burst ROF 3rnd in 9p Short Term ROF 5p Sustained ROF 15p Shell Weight 96.4	Elevation +66 / -7° Traverse 65° Deploy Time 60p Reposition Time 38p Target Size Front 16 Front fire over 7 Side 16 Side fire over 14	Range Maximum 13120 Accuracy Ranging Fire 66 Adjustment Fire 51 Shell Accuracy 39	HE 12 13 AP - WP 8 Smoke Smk 15 Dur 5
leFH18 105mm Howitzer Germany The 105mm leFH18 was the standard divisional field howitzer of the German Army in the Second World War. It was a light, maneuverable gun of split trail design. Introduced in 1935, it served throughout the war.	Towed Length 17.0 Weight 4380 Crew 8 Gunshield PF 30 Burst ROF - Short Term ROF 4p Sustained ROF 10p Shell Weight 32.6	Elevation +40 / -2° Traverse 56° Deploy Time 44p Reposition Time 38p Target Size Front 14 Front fire over 12 Side 14 Side fire over 12	Range Maximum 5840 Accuracy Ranging Fire 34 Adjustment Fire 27 Shell Accuracy 21	HE 3 AP - WP 5 Smoke Smk 10 Dur 4

Aim Time AC	Aim Time Mod			Direct Fire Data Target Range in 2 yard hexes 40	100	150	200	300	400	500	600	700	800	900	1000	1200	1400	1600	1800	2000
4	-14	HE	PEN	163	159	156	153	147	141	136	131	126	121	116	112	103	96	89	82	76
6	-7		PENF	97	95	93	91	87	83	80	77	73	70	67	65	59	54	50	46	42
8	-4																			
10	-1																			
12	1																			
16	4																			
20	6		AOI															1	1	1
			NID	66	65	63	62	60	58	55	53	51	49	48	46	42	39	36	34	31
			DFE	116	45	30	22	14	10	8	6	5	5	4	3	3	2	2	1	1
			BA	31	24	21	18	15	12	10	8	6	5	4	3	1	-1	-3	-4	-5
			TOF	1	4	5	7	11	15	19	23	27	31	35	39	48	57	66	76	86
4	-21	HE	PEN	710	700	691	683	667	651	635	620	605	591	577	563	536	511	487	464	442
6	-12		PENF	443	437	431	426	416	406	396	386	377	368	359	350	333	317	302	288	274
8	-9																			
10	-6																			
12	-4																			
16	0																			
20	3		AOI																	
24	6		NID	322	318	315	311	304	298	291	285	279	273	267	261	250	239	228	219	209
28	9		DFE	380	150	99	74	48	36	28	23	19	17	14	13	10	8	7	6	5
32	10		BA	31	24	21	19	16	14	12	10	9	8	7	6	4	3	1	0	-1
			TOF	1	2	3	4	6	8	10	12	14	17	19	21	25	30	35	39	44
4	-20	HE	PEN	363	357	352	347	337	327	318	309	300	292	284	276	260	246	232	220	207
6	-12		PENF	223	219	216	212	206	200	194	188	183	178	172	167	158	148	140	132	124
8	-8																			
10	-5																			
12	-3																			
16	1																			
20	4		AOI																	
24	7		NID	236	232	229	226	220	214	208	203	197	192	187	182	172	163	155	147	139
28	9		DFE	188	74	49	36	24	17	14	11	9	8	7	6	5	4	3	3	2
32	10		BA	31	24	21	19	15	13	11	9	8	6	5	4	2	1	-1	-2	-3
			TOF	1	3	4	6	9	12	14	18	21	24	27	30	37	43	50	57	64
4	-23	HE	PEN	344	338	333	328	318	308	299	290	282	273	265	257	242	228	215	203	191
6	-15		PENF	210	206	203	199	193	187	181	176	170	165	160	155	145	137	128	120	113
8	-12																			
10	-10																			
12	-8																			
16	-4																			
20	-1		AOI																	
24	2		NID	229	225	222	218	212	206	201	195	190	184	179	174	164	155	147	139	131
28	4		DFE	185	73	48	36	23	17	13	11	9	8	7	6	5	4	3	3	2
32	6		BA	32	25	22	20	16	13	11	9	8	7	5	4	2	0	-1	-3	-4
36	8		TOF	1	3	4	6	9	12	15	18	21	24	27	30	37	44	51	58	65
4	-10	HE	PEN	404	397	392	386	375	364	354	344	334	324	315	306	289	273	258	244	230
6	-3		PENF	248	243	240	236	229	222	216	209	203	197	191	186	175	165	155	146	137
8	0																			
10	2																			
12	4																			
16	7																			
20	10		AOI																	
			NID	267	263	259	256	249	242	236	229	223	217	211	206	195	185	175	166	157
			DFE	215	85	56	41	27	20	16	13	11	9	8	7	6	5	4	3	3
			BA	35	28	24	22	19	16	14	12	11	9	8	7	5	3	1	0	-1
			TOF	1	3	4	5	8	11	14	16	19	22	25	28	34	40	47	53	60
4	-13	HE	PEN	119	116	113	110	106	101	97	92	89	85	81	78	71	65	60	55	51
6	-5		PENF	70	68	66	65	62	59	56	53	51	48	46	44	40	36	33	30	27
8	-2																			
10	1																			
12	3																			
16	6																			
20	8		AOI															1	1	1	1
			NID	35	34	34	33	31	30	29	28	26	25	24	23	21	20	18	16	15
			DFE	96	38	25	18	12	8	7	5	4	4	3	3	2	2	1	1	1
			BA	31	24	21	18	15	12	10	8	7	5	4	3	1	-1	-3	-4	-5
			TOF	2	4	6	8	12	16	21	25	30	34	39	44	53	64	74	85	96

ARTILLERY DATA TABLE

Artillery	Physical Data	Gun Handling	Indirect Fire	Shell Index
sFH18 150mm Howitzer Germany	Towed Length 24.0 Weight 12150 Crew 10 Gunshield PF -	Elevation +45 / -2° Traverse 64° Deploy Time 70p Reposition Time 50p	Range Maximum 7240 Accuracy Ranging Fire 37 Adjustment Fire 28 Shell Accuracy 22	HE 9 AP - WP 8 Smoke Smk 15 Dur 5
The 150mm sFH18 heavy field howitzer was the standard divisional howitzer of the German Army in the Second World War. The 150mm gun was the largest infantry-manned gun used by the German Army.	Burst ROF - Short Term ROF 15p Sustained ROF 30p Shell Weight 95.9	Target Size Front 15 Front fire over 9 Side 16 Side fire over 14		
FH-70 155mm Howitzer International	Towed Length 32.1 Weight 20500 Crew 8 Gunshield PF -	Elevation +70 / -5° Traverse 56° Deploy Time 60p Reposition Time 38p	Range Maximum 13500 Accuracy Ranging Fire 79 Adjustment Fire 61 Shell Accuracy 47	HE 12 13 AP - WP 8 Smoke Smk 15 Dur 5
The FH-70 was developed in the early 1960's as a joint project between the USA, West Germany, and the United Kingdom. The USA dropped out of the effort and developed the M198, while West Germany, the UK, and Italy went on to finish the project. The FH-70 has an Auxilliary Power Unit (APU) which provides hydraulic power for moving, repositioning and laying the gun, as well as reloading. It can attain speeds of 16 km/hr with the APU.	Burst ROF 3rnd in 7p Short Term ROF 5p Sustained ROF 15p Shell Weight 95.9	Target Size Front 17 Front fire over 7 Side 16 Side fire over 14		
M71 155mm Gun-Howitzer Israel	Towed Length 24.6 Weight 20280 Crew 8 Gunshield PF -	Elevation +51 / -3° Traverse 84° Deploy Time 80p Reposition Time 63p	Range Maximum 12850 Accuracy Ranging Fire 111 Adjustment Fire 85 Shell Accuracy 65	HE 12 AP - WP 8 Smoke Smk 15 Dur 5
The M71 is similar to the M68 and is in service with Israel and South Africa. The carriage has a standard split trail and the barrel is rotated 180° for traveling.	Burst ROF - Short Term ROF 7p Sustained ROF 15p Shell Weight 94.6	Target Size Front 16 Front fire over 7 Side 17 Side fire over 14		
M56 105mm Pack Howitzer Italy	Towed Length 12.0 Weight 2844 Crew 7 Gunshield PF 10	Elevation +65 / -5° Traverse 36° Deploy Time 45p Reposition Time 42p	Range Maximum 5780 Accuracy Ranging Fire 34 Adjustment Fire 26 Shell Accuracy 20	HE 3 4 AP 5 WP 5 Smoke Smk 10 Dur 4
The M56 was a very successful pack howitzer exported to over 30 countries. Its light weight and ability to be dismantled into 11 subassemblies makes it easy to transport over rough terrain and it is air portable by small helicopters such as the Bell UH - 1. The weapon can be disassembled in three minutes and assembled in four.	Burst ROF - Short Term ROF 7p Sustained ROF 10p Shell Weight 32.8	Target Size Front 14 Front fire over 13 Side 11 Side fire over 10		
G5 155mm Gun-Howitzer S Africa	Towed Length 31.2 Weight 30310 Crew 5 Gunshield PF -	Elevation +75 / -3° Traverse 65° Deploy Time 83p Reposition Time 73p	Range Maximum 16400 Accuracy Ranging Fire 129 Adjustment Fire 99 Shell Accuracy 76	HE 12 AP - WP 8 Smoke Smk 15 Dur 5
The G5 came into service in 1983 and was designed to give the South African Defense Forces an artillery piece which could outrange the Soviet pieces encountered in Angola. The G5 has an APU which assists in loading and gun handling, but is not set up for burst fire.	Burst ROF - Short Term ROF 10p Sustained ROF 15p Shell Weight 94.6	Target Size Front 16 Front fire over 7 Side 16 Side fire over 14		
FH-77 155mm Field Howitzer Sweden	Towed Length 38.0 Weight 26460 Crew 6 Gunshield PF -	Elevation +70 / -3° Traverse 60° Deploy Time 55p Reposition Time 25p	Range Maximum 13120 Accuracy Ranging Fire 87 Adjustment Fire 67 Shell Accuracy 51	HE 12 13 AP - WP 8 Smoke Smk 15 Dur 5
The FH-77 is a new howitzer developed by Bofors in Sweden. It has an Auxilliary Power Unit (APU) which provides hydraulic power for maneuvering the gun and reloading. The gun carriage can attain speeds of 7 km/hr under its own power. The weapon can be quickly deployed and has a crane for lifting three shells at a time onto the loading table. The sustained rate of fire is limited only by the ability to move ammunition to the gun.	Burst ROF 3rnd in 6p Short Term ROF 3p Sustained ROF 15p Shell Weight 94.6	Target Size Front 17 Front fire over 10 Side 15 Side fire over 13		

Aim Time AC	Mod			Direct Fire Data Target Range in 2 yard hexes 40	100	150	200	300	400	500	600	700	800	900	1000	1200	1400	1600	1800	2000
4	-20	HE	PEN	217	213	210	207	201	195	189	183	178	172	167	162	153	144	135	128	120
6	-12		PENF	130	127	125	123	119	115	111	108	104	101	98	95	89	83	78	73	68
8	-9																			
10	-7																			
12	-5																			
16	-2																			
20	1		AOI																1	1
24	4		NID	142	139	137	135	131	128	124	120	117	113	110	107	101	95	90	84	80
28	6		DFE	107	42	28	21	13	10	8	6	5	4	4	3	3	2	2	2	1
			BA	31	24	21	19	15	13	11	9	8	6	5	4	2	1	-1	-2	-3
			TOF	1	4	6	8	11	15	19	23	27	31	36	40	49	58	67	76	86
4	-10	HE	PEN	523	514	507	500	486	473	460	447	435	423	412	401	379	359	340	322	305
6	-3		PENF	322	316	312	307	299	290	282	274	267	259	252	245	231	218	206	195	184
8	0																			
10	2																			
12	4																			
16	7																			
20	10		AOI																	
			NID	337	332	328	324	315	307	300	292	285	277	270	263	250	238	226	214	204
			DFE	281	111	73	54	35	26	20	17	14	12	10	9	7	6	5	4	4
			BA	35	28	25	22	19	16	14	13	11	10	9	8	6	4	2	1	0
			TOF	1	2	3	5	7	9	12	14	17	19	22	24	30	35	41	46	52
4	-24	HE	PEN	432	425	418	412	401	389	378	368	357	347	338	328	310	293	277	262	247
6	-16		PENF	265	261	257	253	246	239	232	225	218	212	206	200	188	177	167	158	148
8	-13																			
12	-8																			
16	-4																			
20	-1																			
24	2		AOI																	
28	4		NID	284	279	276	272	265	258	251	244	238	232	226	220	208	198	187	178	168
32	6		DFE	230	91	60	44	29	21	17	14	11	10	8	7	6	5	4	3	3
36	9		BA	32	25	22	20	16	14	11	10	8	7	6	4	3	1	-1	-2	-3
44	10		TOF	1	3	4	5	8	10	13	16	19	21	24	27	33	39	45	51	58
4	-10	HE	PEN	120	117	115	112	107	103	98	94	90	86	83	79	73	67	61	56	52
6	-2		PENF	71	69	67	66	63	60	57	54	52	49	47	45	41	37	34	31	28
8	2																			
10	4	HEAT	PEN	493	526	554	582	639	696	754	751	701	658	620	586	530	484	447	416	391
12	6																			
16	10																			
			AOI											1	1	1	1	1	2	2
			NID	16	16	15	15	14	13	12	11	11	10	9	9	8	7	6	5	4
			DFE	65	25	16	12	7	5	4	3	3	2	2	2	1	1	1	1	0
			BA	30	22	18	15	11	7	5	2	0	-1	-3	-4	-7	-9	-10	-12	-13
			TOF	2	5	7	10	15	20	26	31	37	43	50	56	69	83	97	112	128
4	-10	HE	PEN	682	672	663	655	638	622	607	592	577	562	548	534	508	483	459	436	415
6	-3		PENF	424	417	412	406	396	386	376	366	357	348	339	330	313	297	282	268	254
8	0																			
10	2																			
12	4																			
16	7																			
20	10		AOI																	
			NID	438	432	427	422	412	402	393	384	375	366	358	350	334	318	304	290	277
			DFE	353	140	92	68	45	33	26	21	18	15	13	12	9	8	7	6	5
			BA	34	27	24	21	18	15	13	12	10	9	8	7	5	3	1	0	-1
			TOF	1	2	3	4	6	8	11	13	15	17	19	22	26	31	36	41	46
4	-10	HE	PEN	476	468	461	455	442	429	417	405	394	383	372	361	341	322	304	287	272
6	-3		PENF	293	288	284	280	272	264	256	248	241	234	227	221	208	196	185	174	164
8	0																			
10	2																			
12	4																			
16	7																			
20	10		AOI																	
			NID	308	303	299	295	287	280	272	265	258	251	245	238	226	214	203	192	182
			DFE	263	104	68	51	33	24	19	15	13	11	10	9	7	6	5	4	3
			BA	35	28	24	22	18	16	14	12	10	9	8	7	5	3	1	0	-1
			TOF	1	2	4	5	7	10	12	15	17	20	23	25	31	37	42	48	54

ARTILLERY DATA TABLE

Artillery	Physical Data	Gun Handling	Indirect Fire	Shell Index
GP M1966 76mm Mountain Gun USSR The 76mm Mountain Gun GP is similar to the M56 Italian pack howitzer and has been used by Soviet forces in Afghanistan. It has a split trail and two piece gun shield.	Towed Length 15.7 Weight 1720 Crew 7 Gunshield PF 30 Burst ROF - Short Term ROF 2p Sustained ROF 15p Shell Weight 13.7	Elevation +65 / -5° Traverse 50° Deploy Time 40p Reposition Time 40p Target Size Front 12 Front fire over 10 Side 10 Side fire over 7	Range Maximum 6010 Accuracy Ranging Fire 41 Adjustment Fire 32 Shell Accuracy 25	HE 1 AP - WP - Smoke Smk - Dur -
M1931/37 122mm Corps Gun USSR The M1931/37 was developed shortly before the Second World War. It was based upon the M1931 gun and shares the same carriage as the M1937 152mm gun. The M1931/37 served throughout the Second World War but has been replaced by the M-46 and D-74 in the Soviet Army and the Warsaw Pact.	Towed Length 25.8 Weight 17750 Crew 8 Gunshield PF 30 Burst ROF - Short Term ROF 5p Sustained ROF 15p Shell Weight 48.0	Elevation +65 / -2° Traverse 58° Deploy Time 60p Reposition Time 68p Target Size Front 16 Front fire over 13 Side 16 Side fire over 13	Range Maximum 11370 Accuracy Ranging Fire 81 Adjustment Fire 63 Shell Accuracy 48	HE 6 AP - WP 6 Smoke Smk 12 Dur 4
D-30 122mm Howitzer USSR The D-30 replaced the M-30 in the early 1960's and has a full 360° firing traverse. The weapon has three trails which support the gun once it has been raised up on the firing jack. The D-30 is still in production and has been widely exported throughout the Warsaw Pact, Africa, and the Middle East. It has a highly effective fin stabilized HEAT round.	Towed Length 17.7 Weight 7080 Crew 7 Gunshield PF 30 Burst ROF - Short Term ROF 4p Sustained ROF 15p Shell Weight 48.0	Elevation +70 / -7° Traverse 360° Deploy Time 80p Reposition Time - Target Size Front 13 Front fire over 9 Side 13 Side fire over 11	Range Maximum 6420 Accuracy Ranging Fire 73 Adjustment Fire 56 Shell Accuracy 43	HE 6 AP 7 WP 6 Smoke Smk 12 Dur 4
D-74 122mm Field Gun USSR The D-74 was introduced in 1955 and was to replace the M1931/37 122mm Corps Gun. At the same time, the M-46 130mm Field Gun was also developed. Although the M-46 was chosen over the D-74, a number of D-74's were produced and exported. The weapon is in service in China, Cuba, North Korea, Africa, and Vietnam.	Towed Length 32.4 Weight 12235 Crew 10 Gunshield PF 30 Burst ROF - Short Term ROF 4p Sustained ROF 15p Shell Weight 47.8	Elevation +45 / -5° Traverse 58° Deploy Time 65p Reposition Time 52p Target Size Front 15 Front fire over 10 Side 14 Side fire over 13	Range Maximum 13120 11 Accuracy Ranging Fire 81 Adjustment Fire 63 Shell Accuracy 48	HE 6 AP - WP 6 Smoke Smk 12 Dur 4
M-46 130mm Field Gun USSR The M-46 was developed in the mid-1950's and has replaced the M1931/37 Corps Gun. It is ballistically identical to the Soviet Naval gun of the same caliber. The M-46 has been widely exported and was used extensively by the North Vietnamese Army. It is still in service throughout Africa and the Warsaw Pact.	Towed Length 38.5 Weight 18630 Crew 9 Gunshield PF 30 Burst ROF - Short Term ROF 5p Sustained ROF 15p Shell Weight 73.6	Elevation +45 / -2.5° Traverse 50° Deploy Time 62p Reposition Time 68p Target Size Front 15 Front fire over 10 Side 15 Side fire over 14	Range Maximum 14840 18 Accuracy Ranging Fire 98 Adjustment Fire 76 Shell Accuracy 58	HE 8 AP - WP 7 Smoke Smk 13 Dur 4
M1937 152mm Gun-Howitzer USSR The M1937 was developed just before the Second World War as a replacement for the M1910/34. It was used extensively in the Second World War but is no longer in service in the Soviet Army. It is still found in reserve units within the Warsaw Pact and is in use in Africa and Southeast Asia.	Towed Length 23.6 Weight 17800 Crew 9 Gunshield PF 30 Burst ROF - Short Term ROF 8p Sustained ROF 15p Shell Weight 95.9	Elevation +65 / -2° Traverse 58° Deploy Time 65p Reposition Time 60p Target Size Front 16 Front fire over 13 Side 15 Side fire over 12	Range Maximum 9440 Accuracy Ranging Fire 68 Adjustment Fire 53 Shell Accuracy 41	HE 9 AP - WP 8 Smoke Smk 15 Dur 5

Aim Time AC	Aim Time Mod			Direct Fire Data Target Range in 2 yard hexes 40	100	150	200	300	400	500	600	700	800	900	1000	1200	1400	1600	1800	2000
4	-9	HE	PEN	132	128	124	121	115	109	104	99	94	89	85	80	73	66	60	54	49
6	-1		PENF	80	77	75	73	69	66	62	59	56	53	50	47	42	38	34	31	27
8	2																			
10	4	HEAT	PEN	458	517	567	617	721	825	931	927	842	772	714	665	588	530	485	450	422
12	6																			
16	8																			
			AOI								1	1	1	1	1	2	3	3	4	5
			NID	3	3	3	2	2	2	2	2	1	1	1	1	1	1	1	0	0
			DFE	36	14	9	6	4	3	2	1	1	1	1	1	1	1	1	1	1
			BA	30	21	17	14	9	6	3	1	-1	-3	-4	-6	-8	-10	-12	-13	-14
			TOF	3	6	10	13	21	28	36	44	53	62	71	81	101	123	145	168	193
4	-22	HE	PEN	438	430	423	417	405	393	381	370	359	348	338	328	309	291	274	258	243
6	-15		PENF	271	266	262	258	250	243	235	228	221	214	208	202	190	178	168	158	148
8	-12																			
10	-9	APC	PENF	17H	17H	17H	16H	16H	15H	15H	14H	14H	14H	13H	13H	12H	11H	11H	996	937
12	-7																			
16	-4																			
20	-1		AOI																	
24	1		NID	173	170	168	166	161	157	153	148	144	140	137	133	126	119	112	106	101
28	4		DFE	281	111	73	54	35	26	20	16	14	12	10	9	7	6	5	4	4
32	5		BA	31	24	21	19	16	13	11	10	8	7	6	5	3	1	0	-1	-3
36	6		TOF	1	2	3	5	7	9	12	14	17	19	22	25	30	35	41	47	53
4	-16	HE	PEN	286	280	275	270	260	251	242	234	225	217	210	202	188	175	163	152	142
6	-8		PENF	175	171	168	165	159	153	147	142	136	131	127	122	113	105	97	90	84
8	-4																			
10	-2	HEAT	PEN	44H	46H	48H	50H	54H	58H	62H	62H	58H	55H	52H	49H	44H	40H	37H	34H	32H
12	0																			
16	4																			
20	7		AOI																	
24	8		NID	126	124	122	120	116	112	108	105	102	98	95	92	86	81	75	71	66
			DFE	240	94	62	46	30	22	17	14	11	10	8	7	6	5	4	3	3
			BA	32	25	22	19	15	13	10	9	7	5	4	3	1	-1	-3	-4	-5
			TOF	1	2	4	5	8	10	13	16	18	21	24	27	33	39	45	52	58
4	-20	HE	PEN	582	573	565	558	543	529	515	502	489	476	463	451	428	406	385	365	347
6	-12		PENF	363	357	352	347	338	329	320	312	303	295	288	280	265	251	238	225	214
8	-9																			
10	-6	APC	PENF	21H	20H	20H	20H	19H	19H	18H	18H	17H	17H	16H	16H	15H	14H	13H	12H	12H
12	-4																			
16	0																			
20	3		AOI																	
24	6		NID	208	205	202	199	194	189	184	179	175	170	165	161	153	145	137	130	124
28	8		DFE	343	136	89	66	43	32	25	20	17	15	13	11	9	7	6	5	4
			BA	32	25	22	20	17	14	12	11	9	8	7	6	4	2	1	-1	-2
			TOF	1	2	3	4	6	9	11	13	15	18	20	22	27	32	37	42	47
4	-22	HE	PEN	903	891	881	871	851	832	813	794	776	758	741	724	692	661	631	603	576
6	-14		PENF	565	557	551	544	532	520	508	496	485	473	462	452	431	412	393	375	358
8	-11																			
10	-8	APC	PENF	27H	27H	27H	26H	26H	25H	25H	24H	24H	23H	22H	22H	21H	20H	19H	18H	17H
12	-6																			
16	-2																			
20	1		AOI																	
24	4		NID	404	399	395	391	383	375	367	360	352	345	338	331	317	304	292	280	269
28	6		DFE	484	192	127	94	62	46	36	29	25	21	19	16	13	11	9	8	7
32	8		BA	31	24	21	19	16	14	12	10	9	8	7	6	4	3	1	0	-1
36	10		TOF	1	2	3	4	5	7	9	11	13	15	16	18	26	26	30	35	39
4	-22	HE	PEN	363	357	352	347	337	327	318	309	300	292	283	275	260	246	232	219	207
6	-15		PENF	222	219	215	212	206	200	194	188	183	177	172	167	157	148	140	131	124
8	-12																			
10	-9	APC	PENF	12H	12H	11H	11H	11H	11H	10H	10H	983	956	930	905	856	810	767	725	686
12	-7																			
16	-4																			
20	-1		AOI																	
24	1		NID	231	227	224	222	216	211	206	201	196	191	186	182	173	164	156	149	142
28	3		DFE	158	62	41	31	20	15	11	9	8	7	6	5	4	3	3	2	2
32	5		BA	31	24	21	19	16	13	11	10	8	7	6	5	3	2	0	-1	-2
36	6		TOF	1	3	5	6	9	13	16	19	22	26	29	33	40	47	54	62	69

ARTILLERY DATA TABLE

Artillery	Physical Data	Gun Handling	Indirect Fire	Shell Index
M1943 D-1 152mm Howitzer USSR	Towed Length 24.8 Weight 8020	Elevation +63.5 / -3° Traverse 35°	Range Maximum 6780	HE 9
The D-1 was introduced in 1943 as a replacement for the M1938 152mm Howitzer. It fires the same ammunition but is much lighter, and eighteen D-1's were issued to each motorized rifle division in the Soviet Army. The D-1 has been largely replaced by self propelled howitzers in the USSR, but it is still found in service throughout Africa, China, and Southeast Asia.	Crew 7 Gunshield PF 30 Burst ROF - Short Term ROF 8p Sustained ROF 20p Shell Weight 95.9	Deploy Time 47p Reposition Time 55p Target Size Front 15 Front fire over 10 Side 15 Side fire over 12	Accuracy Ranging Fire 47 Adjustment Fire 36 Shell Accuracy 28	AP 11 WP 8 Smoke Smk 15 Dur 5
D-20 152mm Gun-Howitzer USSR	Towed Length 28.5 Weight 18670	Elevation +63 / -5° Traverse 58°	Range Maximum 9520	HE 9
The D-20 replaced the ML-20 in the mid-1950's. It has been widely exported and is found in three batteries of six per artillery regiment in motorized rifle divisions. Like the D-1, the D-20 is being replaced by self propelled howitzers in the Soviet Army, but many units still rely on the towed model.	Crew 10 Gunshield PF 30 Burst ROF - Short Term ROF 5p Sustained ROF 15p Shell Weight 95.9	Deploy Time 65p Reposition Time 50p Target Size Front 16 Front fire over 12 Side 15 Side fire over 14	Accuracy Ranging Fire 67 Adjustment Fire 52 Shell Accuracy 40	AP 11 WP 8 Smoke Smk 15 Dur 5
2A36 152mm Gun USSR	Towed Length 42.4 Weight 21600	Elevation +57 / -2.5° Traverse 50°	Range Maximum 14760	HE 9 10
The 2A36 was introduced in the mid-1970's and began to enter operational service in the early 1980's. It is replacing the 130mm M-46 in category 1 independent artillery brigades and artillery divisions. A new set of 152mm ammunition has been developed for this weapon which provides improved range and lethality.	Crew 8 Gunshield PF 30 Burst ROF - Short Term ROF 5p Sustained ROF 15p Shell Weight 95.9	Deploy Time 70p Reposition Time 60p Target Size Front 16 Front fire over 13 Side 16 Side fire over 14	Accuracy Ranging Fire 97 Adjustment Fire 75 Shell Accuracy 57	AP - WP 8 Smoke Smk 15 Dur 5
S-23 180mm Gun USSR	Towed Length 34.4 Weight 47290	Elevation +50 / -2° Traverse 44°	Range Maximum 16620	HE 14
The S-23 was developed from a naval gun in the 1950's. For many years it was mistakenly identified in the West as the 203mm gun-howitzer M1955, until some were captured in the Middle East by the Israelis. In the Soviet army, there are 12 S-23's in the heavy artillery brigade of an artillery division.	Crew 16 Gunshield PF - Burst ROF - Short Term ROF 30p Sustained ROF 60p Shell Weight 185.4	Deploy Time 80p Reposition Time 80p Target Size Front 16 Front fire over 7 Side 17 Side fire over 14	Accuracy Ranging Fire 92 Adjustment Fire 71 Shell Accuracy 54	AP - WP 9 Smoke Smk 18 Dur 5
L118 105mm Light Gun UK	Towed Length 16.0 Weight 4100	Elevation +70 / -5.5° Traverse 11°	Range Maximum 9400	HE 3 4
In the mid-1970's, the British Army replaced their M56 Melara Italian Pack Howitzers with the L118. The L118 has also been chosen by the US Army as its new light howitzer and is called the M119. The US version fires standard US 105mm M1 ammunition. In the British Army, each Light Gun Regiment has three batteries of eight guns.	Crew 8 Gunshield PF - Burst ROF - Short Term ROF 4p Sustained ROF 10p Shell Weight 32.8	Deploy Time 65p Reposition Time 32p Target Size Front 13 Front fire over 7 Side 14 Side fire over 12	Accuracy Ranging Fire 38 Adjustment Fire 29 Shell Accuracy 22	AP 5 WP 5 Smoke Smk 10 Dur 4
25 Pounder Field Gun UK	Towed Length 26.0 Weight 3970	Elevation +40 / -5° Traverse 8°	Range Maximum 6700	HE 2
The 25 Pounder Field Gun was developed late in the 1930's and served throughout the Second World War. It has been widely exported and is still in service in many parts of Africa and Asia. The 25 Pound Field Gun and US 105mm and 155mm guns were the primary artillery pieces used by British forces during the Second World War.	Crew 6 Gunshield PF 30 Burst ROF - Short Term ROF 6p Sustained ROF 10p Shell Weight 25.0	Deploy Time 60p Reposition Time 25p Target Size Front 14 Front fire over 12 Side 14 Side fire over 12	Accuracy Ranging Fire 25 Adjustment Fire 20 Shell Accuracy 15	AP - WP 5 Smoke Smk 10 Dur 4

Aim Time AC	Aim Time Mod			Direct Fire Data Target Range in 2 yard hexes 40	100	150	200	300	400	500	600	700	800	900	1000	1200	1400	1600	1800	2000
4	-17	HE	PEN	206	202	198	195	188	182	176	170	165	159	154	149	139	131	122	115	107
6	-8		PENF	123	120	118	116	112	108	104	100	97	93	90	87	81	75	70	65	60
8	-4																			
10	-1	HEAT	PEN	29H	30H	31H	31H	32H	34H	35H	35H	34H	33H	32H	31H	29H	28H	26H	25H	24H
12	1																			
16	5																			
20	8		AOI																1	1
			NID	149	146	144	142	138	133	130	126	122	118	115	112	105	99	93	88	83
			DFE	113	45	29	22	14	10	8	7	5	5	4	3	3	2	2	2	1
			BA	31	24	21	18	15	12	10	8	7	5	4	3	1	-1	-2	-4	-5
			TOF	1	4	5	7	11	15	19	23	27	31	35	39	48	56	65	74	84
4	-20	HE	PEN	363	357	352	347	337	327	318	309	300	292	284	276	260	246	232	219	207
6	-12		PENF	223	219	215	212	206	200	194	188	183	177	172	167	157	148	140	132	124
8	-8																			
10	-5	HEAT	PEN	30H	31H	31H	32H	33H	34H	35H	34H	32H	31H	30H	29H	28H	26H	25H	23H	22H
12	-3																			
16	1																			
20	4		AOI																	
24	7		NID	201	197	195	192	187	182	177	172	167	162	158	154	145	137	130	123	116
28	9		DFE	158	62	41	30	20	15	11	9	8	7	6	5	4	3	3	2	2
32	10		BA	32	25	22	20	16	14	12	10	8	7	6	5	3	1	0	-2	-3
			TOF	1	3	5	6	9	13	16	19	22	26	29	33	40	47	55	62	70
4	-24	HE	PEN	608	599	591	583	568	554	539	526	512	499	486	474	450	427	406	385	366
6	-16		PENF	376	370	365	360	351	341	332	324	315	307	299	291	276	261	248	235	223
8	-13																			
12	-8																			
16	-4																			
20	-1																			
24	1		AOI																	
28	4		NID	377	372	367	363	354	346	338	330	322	314	307	300	286	272	259	247	236
32	6		DFE	317	125	83	61	40	30	23	19	16	14	12	10	8	7	6	5	4
36	8		BA	32	25	22	20	17	14	13	11	9	8	7	6	4	3	1	0	-1
44	10		TOF	1	2	3	4	7	9	11	13	16	18	21	23	28	33	38	43	49
4	-30	HE	PEN	772	763	756	749	734	720	706	692	679	666	653	640	616	592	569	548	527
8	-22		PENF	479	473	469	464	455	446	437	428	420	412	403	395	380	365	351	337	324
12	-19																			
16	-16																			
20	-14																			
28	-10																			
36	-7		AOI																	
44	-4		NID	729	721	715	709	696	683	671	659	648	636	625	613	592	571	551	531	512
60	0		DFE	274	109	72	54	35	26	20	17	14	12	11	10	8	6	5	5	4
68	2		BA	32	26	23	20	17	15	13	11	10	9	8	7	5	4	2	1	0
76	4		TOF	1	2	3	5	7	9	12	14	17	19	22	24	29	35	40	45	51
4	-12	HE	PEN	134	131	128	125	120	115	110	105	101	96	92	89	81	75	69	64	59
6	-3		PENF	80	78	76	74	71	67	64	61	59	56	53	51	46	42	38	35	32
8	0																			
10	3	HEAT	PEN	542	580	611	643	707	772	837	834	778	729	686	648	584	533	491	457	428
12	5																			
16	9																			
20	10		AOI												1	1	1	1	1	2
			NID	17	17	16	16	15	14	13	12	11	11	10	9	8	7	6	5	5
			DFE	69	27	17	13	8	6	4	3	3	2	2	2	1	1	1	1	1
			BA	31	23	19	16	11	8	5	3	1	-1	-2	-4	-6	-8	-10	-12	-13
			TOF	2	5	7	9	14	20	25	30	36	42	48	54	67	80	94	108	123
4	-12	HE	PEN	144	141	138	135	130	125	120	116	111	107	103	99	91	84	78	72	67
6	-4		PENF	87	85	83	81	78	75	72	69	66	63	60	58	53	49	45	41	38
8	-1																			
10	2	APC	PENF	498	483	472	461	439	418	398	379	361	344	328	312	284	257	234	212	192
12	4																			
16	7																			
20	8		AOI																	1
			NID	32	31	30	30	28	27	26	25	24	23	22	21	19	18	16	15	14
			DFE	162	63	41	31	20	14	11	9	7	6	5	5	4	3	2	2	2
			BA	32	25	22	19	16	13	11	9	8	6	5	4	2	0	-1	-3	-4
			TOF	1	3	5	6	9	13	16	19	23	26	30	34	41	49	57	66	74

ARTILLERY DATA TABLE

Artillery	Physical Data	Gun Handling	Indirect Fire	Shell Index
M102 105mm Howitzer USA	Towed Length 17.0 Weight 3300 Crew 8 Gunshield PF - Burst ROF - Short Term ROF 3p Sustained ROF 10p Shell Weight 32.8	Elevation +75 / -5° Traverse 10° Deploy Time 80p Reposition Time 22p Target Size Front 12 Front fire over 7 Side 13 Side fire over 12	Range Maximum 6290 Accuracy Ranging Fire 37 Adjustment Fire 29 Shell Accuracy 22	HE 3 4 AP 5 WP 5 Smoke Smk 10 Dur 4
The M102 was produced in the mid-1960's and is the standard howitzer of Airborne and Air Mobile Divisions. The weapon was used extensively in Vietnam and is being replaced by the M119 (see L118 above). There are three batteries of eight guns in each battalion. The M102 is similar to the M101 but is much lighter and fires from a circular baseplate which allows rapid 360° rotation.				
M101 105mm Howitzer USA	Towed Length 19.6 Weight 4475 Crew 8 Gunshield PF - Burst ROF - Short Term ROF 3p Sustained ROF 10p Shell Weight 32.8	Elevation +66 / -5° Traverse 46° Deploy Time 54p Reposition Time 38p Target Size Front 12 Front fire over 7 Side 13 Side fire over 12	Range Maximum 6160 Accuracy Ranging Fire 35 Adjustment Fire 27 Shell Accuracy 21	HE 3 4 AP 5 WP 5 Smoke Smk 10 Dur 4
The M101 Howitzer was developed prior to the Second World War and was the standard gun of the US Army. Over 10,000 were produced and many saw action in Vietnam. Today, the M101 has largely been replaced by the M102, but a large number are still in inventory. During the Second World War, the M101 was also widely used by British and French forces.				
M114 155mm Howitzer USA	Towed Length 24.0 Weight 12790 Crew 11 Gunshield PF - Burst ROF - Short Term ROF 15p Sustained ROF 20p Shell Weight 94.6	Elevation +63 / -2° Traverse 49° Deploy Time 65p Reposition Time 50p Target Size Front 14 Front fire over 7 Side 15 Side fire over 10	Range Maximum 7980 Accuracy Ranging Fire 58 Adjustment Fire 45 Shell Accuracy 34	HE 12 AP - WP 8 Smoke Smk 15 Dur 5
The M114 was developed shortly after the Second World War. It has been widely exported and is essentially identical to the M1 155mm Howitzer used by French, British, and US forces in the Second World War. The M114 is being replaced by the M198 in the US Army, but will likely remain in service for a number of years.				
M198 155mm Howitzer USA	Towed Length 40.5 Weight 15790 Crew 11 Gunshield PF - Burst ROF - Short Term ROF 15p Sustained ROF 20p Shell Weight 94.6	Elevation +72 / -5° Traverse 45° Deploy Time 68p Reposition Time 55p Target Size Front 14 Front fire over 7 Side 15 Side fire over 13	Range Maximum 9890 Accuracy Ranging Fire 85 Adjustment Fire 65 Shell Accuracy 50	HE 12 13 AP - WP 8 Smoke Smk 15 Dur 5
The M198 was developed to replace the M114 and production began in the late 1970's. By 1988 approximately 1800 had been produced and delivered to the US Army and Marine Corps. The M198 is found in batteries of eight guns, and there are three batteries per gun battalion.				
M115 8 Inch Howitzer USA	Towed Length 36.0 Weight 32000 Crew 14 Gunshield PF - Burst ROF - Short Term ROF 30p Sustained ROF 60p Shell Weight 204.0	Elevation +65 / -2° Traverse 60° Deploy Time 90p Reposition Time 75p Target Size Front 15 Front fire over 8 Side 18 Side fire over 14	Range Maximum 9180 Accuracy Ranging Fire 66 Adjustment Fire 51 Shell Accuracy 39	HE 15 AP - WP 10 Smoke Smk 20 Dur 5
Development of the 8 inch howitzer began in the 1920's, and shortly before the Second World War the weapon was standardized as the M1 8 inch Howitzer. After the war it was redesignated the M115 Heavy Towed Howitzer.				
16 inch Naval Gun USA	Towed Length - Weight - Crew - Gunshield PF - Burst ROF - Short Term ROF 60p Sustained ROF 90p Shell Weight 2100	Elevation - Traverse - Deploy Time - Reposition Time - Target Size Front - Front fire over - Side - Side fire over -	Range Maximum 20000 Accuracy Ranging Fire 86 Adjustment Fire 68 Shell Accuracy 53	HE 16 AP - WP - Smoke Smk - Dur -
The 16 inch gun was the largest naval gun of the US Navy in World War II, and there were 9 of them on each Iowa class Battleship. Four Iowa class Battleships were recommissioned after World War II and saw action in the Middle East. Present plans call for them to be taken out of service.				

Aim Time AC	Aim Time Mod			Direct Fire Data Target Range in 2 yard hexes 40	100	150	200	300	400	500	600	700	800	900	1000	1200	1400	1600	1800	2000
4	-11	HE	PEN	131	128	125	122	117	112	107	103	98	94	90	87	79	73	67	62	57
6	-2		PENF	78	76	74	72	69	66	63	60	57	54	52	50	45	41	37	34	31
8	1																			
10	4	HEAT	PEN	545	582	614	645	709	773	837	834	779	730	687	650	586	536	494	460	431
12	6																			
16	10																			
			AOI												1	1	1	1	1	2
			NID	17	16	16	15	14	13	12	12	11	10	10	9	8	7	6	5	5
			DFE	67	26	17	12	8	6	4	3	3	2	2	2	1	1	1	1	0
			BA	31	23	19	16	11	8	5	3	1	-1	-3	-4	-6	-8	-10	-12	-13
			TOF	2	5	7	10	15	20	25	31	37	43	49	55	68	81	96	110	126
4	-13	HE	PEN	120	117	115	112	107	103	98	94	90	86	83	79	73	67	61	56	52
6	-4		PENF	71	69	67	66	63	60	57	54	52	49	47	45	41	37	34	31	28
8	-1																			
10	2	HEAT	PEN	566	602	633	665	727	790	853	821	768	722	681	645	585	536	496	462	434
12	4																			
16	8																			
20	10		AOI											1	1	1	1	1	2	2
			NID	15	15	14	14	13	12	11	11	10	9	9	8	7	6	5	5	4
			DFE	61	24	15	11	7	5	4	3	2	2	2	1	1	1	1	1	0
			BA	31	23	19	16	11	8	5	3	1	-1	-3	-4	-6	-8	-10	-12	-13
			TOF	2	5	8	10	15	21	27	32	38	45	51	58	71	86	101	116	132
4	-20	HE	PEN	261	256	252	248	241	233	226	219	212	205	199	193	181	170	160	150	141
6	-12		PENF	157	154	152	149	144	140	135	130	126	122	118	114	107	100	93	87	82
8	-8																			
10	-5																			
12	-3																			
16	1																			
20	4		AOI																	1
24	7		NID	176	173	171	168	163	158	154	149	145	140	136	132	124	117	110	104	98
28	9		DFE	139	55	36	27	17	13	10	8	7	6	5	4	3	3	2	2	2
32	10		BA	32	25	22	19	16	13	11	9	8	6	5	4	2	0	-1	-3	-4
			TOF	1	3	5	7	10	13	17	20	24	28	31	35	43	51	59	67	76
4	-22	HE	PEN	379	372	367	361	351	340	330	321	311	302	293	285	268	253	268	225	212
6	-14		PENF	232	229	224	221	214	207	201	195	189	183	178	172	162	152	159	135	126
8	-10																			
10	-7																			
12	-5																			
16	-1																			
20	2		AOI																	
24	5		NID	250	246	242	239	233	226	220	214	208	202	197	191	181	171	162	153	145
28	7		DFE	205	81	53	40	26	19	15	12	10	9	7	6	5	4	4	3	3
32	9		BA	33	26	23	20	17	14	12	10	8	7	6	5	3	1	-1	-2	-3
36	10		TOF	1	3	4	5	8	11	14	17	20	23	26	29	35	41	48	55	62
4	-26	HE	PEN	395	389	384	379	370	361	352	343	335	326	318	311	296	281	268	255	243
8	-16		PENF	240	236	233	230	224	218	212	207	201	196	191	186	177	168	159	151	143
12	-12																			
16	-9																			
20	-6																			
24	-4																			
28	-2		AOI																	
32	0		NID	478	471	466	460	450	439	429	419	409	400	390	381	364	347	331	316	301
36	2		DFE	151	60	39	29	19	14	11	9	8	7	6	5	4	3	3	2	2
44	5		BA	33	26	23	20	17	14	12	10	9	7	6	5	3	1	0	-2	-3
52	8		TOF	1	3	5	6	10	13	16	19	23	26	30	33	40	48	55	63	70
4	-22	HE	PEN	28H	28H	27H	27H	27H	27H	27H	26H	26H	26H	26H	25H	25H	25H	24H	24H	23H
6	-10		PENF	17H	17H	17H	17H	17H	17H	17H	17H	16H	16H	16H	16H	16H	15H	15H	15H	15H
8	-6																			
10	-2																			
12	1																			
16	7																			
20	11		AOI																	
24	15		NID	155H	154H	154H	153H	152H	151H	150H	148H	147H	146H	145H	144H	142H	139H	137H	135H	133H
28	18		DFE	321	128	85	64	42	31	25	21	18	15	13	12	10	8	7	6	6
32	20		BA	29	23	20	18	15	13	11	10	8	7	6	5	4	3	2	1	0
			TOF	1	2	3	4	6	9	11	13	15	17	20	22	26	31	36	40	45

MORTAR BURST DATA TABLE

1 60mm HE USA

			Burst Data	Range from Burst in 2 yard hexes												Penetration and Critical Range	
			0	1	2	3	4	5	6	8	10	12	15	20	30	40	
Airburst	0 - 6	PEN	4.0	4.0	3.8	3.7	3.5	3.3	3.1	2.7	2.4	2.1	1.7	1.2	.6		PEN 5.1
		DC	2	2	2	2	2	2	2	2	1	1	1	1	1		PENF 1.1
	7 - 8	PEN	3.8	3.8	3.7	3.6	3.5	3.3	3.2	2.9	2.6	2.4	2.0	1.6	.9	.6	
		DC	3	3	3	3	2	2	2	2	2	2	2	1	1	1	BC Contact 13K
	9	PEN	3.4	3.4	3.3	3.3	3.1	3.0	2.9	2.7	2.5	2.3	2.0	1.6	1.0	.6	
		DC	3	3	3	3	3	3	2	2	2	2	2	1	1	1	
		BSHC	3	3	2	1	1	1	-1	-3	-4	-5	-7	-9	-12	-14	
		BC	22	21	17	14	11	8	7	5	3	3	2	1	1		
	0 - 1	ID	5	5	4	4	4	3	3	2	1	1					
	2 - 7	ID	7	7	7	6	6	5	5	4	3	2	1	1			
	8 - 9	ID	10	10	10	9	8	8	7	6	4	4	2	1			
		BSCC	1	1	0	-2	-3	-4	-5	-7	-8	-9	-11	-13			
Burst on Earth	0 - 6	PEN	2.0	1.9	1.7	1.6	1.4	1.3	1.2	1.0	.8	.7	.5				Standing 2
		DC	1	1	1	1	1	1	1	1	1	1	1				Kneel/Fire Over 1
	7 - 8	PEN	2.1	2.0	1.9	1.8	1.7	1.6	1.5	1.3	1.2	1.0	.9	.6			Hands & Knees 1
		DC	2	2	2	1	1	1	1	1	1	1	1	1			Crawl 0
	9	PEN	2.1	2.0	1.9	1.8	1.7	1.7	1.6	1.4	1.3	1.1	1.0	.8	.4		Prone 0
		DC	2	2	2	1	1	1	1	1	1	1	1	1	1		
		BSHC	32	8	2	0	-3	-5	-6	-8	-9	-11	-12	-14	-17		Collapse Radius -
		BSCC	*1	27	6	3	1	1	-1	-4	-5	-6	-8	-10	-13		
		BC	739	155	20	9	5	3	2	1	1	1	1				
	0 - 1	ID	11	10	10	9	9	8	8	7							
	2 - 7	ID	19	19	18	17	16	15	15	13							
	8 - 9	ID	31	31	29	28	27	26	25	23							
		BSCC	0	-6	-11	-14	-16	-17	-19	-21							
Burst on Rock	0 - 6	PEN	4.9	4.8	4.4	4.1	3.8	3.5	3.3	2.8	2.5	2.1	1.7	1.2	.6		Standing 4
		DC	3	2	2	2	2	2	2	2	1	1	1	1	1		Kneel/Fire Over 2
	7 - 8	PEN	4.5	4.3	4.1	3.9	3.7	3.5	3.3	3.0	2.7	2.4	2.1	1.6	.9	.6	Hands & Knees 1
		DC	3	3	3	3	3	2	2	2	2	2	2	1	1	1	Crawl 1
	9	PEN	3.9	3.8	3.6	3.5	3.3	3.2	3.0	2.8	2.5	2.3	2.0	1.6	1.0	.6	Prone 1
		DC	3	3	3	3	3	3	3	2	2	2	2	1	1	1	
		BSHC	*1	28	7	3	1	1	-1	-3	-5	-6	-8	-10	-13	-15	Collapse Radius -
		BSCC	*1	32	8	3	2	1	0	-3	-5	-6	-7	-10	-12	-14	
		BC	734	174	50	22	13	9	7	4	3	2	2	1			
	0 - 1	ID	1	1	1	1											
	2 - 7	ID	2	2	1	1	1	1	1	1							
	8 - 9	ID	3	3	2	2	2	2	2	1	1						
		BSCC	1	-4	-9	-12	-14	-15	-17	-19	-20						
Burst on Sand or Ice	0 - 6	PEN	1.0														Standing 3
		DC	1														Kneel/Fire Over 2
	7 - 8	PEN	1.3														Hands & Knees 1
		DC	1														Crawl 1
	9	PEN	1.3														Prone 1
		DC	1														
		BSHC															Collapse Radius -
		BSCC	1														
		BC	734	176	51	12	6	4	3	2	1						
Burst in a Flooded Rice Paddy	0 - 6	PEN	.7														Standing 3
		DC	1														Kneel/Fire Over 2
	7 - 8	PEN	1.0														Hands & Knees 1
		DC	1														Crawl 1
	9	PEN	1.1														Prone 1
		DC	1														
		BSHC															Collapse Radius -
		BSCC	1														
		BC	739	175	28	10	5	3	2	1	1						

MORTAR BURST DATA TABLE

2 81mm HE USA

			Burst Data	Range from Burst in 2 yard hexes												Penetration and Critical Range	
			0	1	2	3	4	5	6	8	10	12	15	20	30	40	
Airburst	0 - 6	PEN	3.6	3.5	3.4	3.2	3.0	2.8	2.6	2.2	1.8	1.5	1.2	.7			PEN 11
		DC	2	2	2	2	1	1	1	1	1	1	1	1			PENF 3.1
	7 - 8	PEN	7.8	7.7	7.5	7.3	7.0	6.7	5.8	5.8	5.2	4.7	4.0	3.0	1.7	1.0	
		DC	4	4	4	4	3	3	3	3	3	3	2	2	1	1	BC Contact 97K
	9	PEN	11	11	11	11	10	9.8	8.7	8.7	8.0	7.4	6.5	5.2	3.4	2.2	
		DC	6	5	5	5	5	5	5	5	4	4	4	3	2	2	
		BSHC	24	22	18	13	10	7	5	3	2	1	1	-2	-5	-7	
		BC	54	51	42	33	26	20	16	11	8	6	4	3	1	1	
	0 - 1	ID	5	5	4	4	3	3	3	2	1	1					
	2 - 7	ID	7	7	7	6	6	5	5	4	3	2	1				
	8 - 9	ID	10	10	10	9	8	8	7	6	4	3	2	1			
		BSCC	1	1	1	1	-2	-3	-4	-5	-7	-8	-9	-11			
Burst on Earth	0 - 6	PEN	4.6	4.4	4.0	3.7	3.4	3.1	2.8	2.3	1.9	1.6	1.2	.8			Standing 3
		DC	2	2	2	2	2	2	1	1	1	1	1	1			Kneel/Fire Over 2
	7 - 8	PEN	9.1	8.9	8.4	7.9	7.5	7.1	6.7	6.0	5.4	4.8	4.1	3.1	1.8	1.0	Hands & Knees 1
		DC	4	4	4	4	4	3	3	3	3	3	2	2	1	1	Crawl 1
	9	PEN	13	12	12	11	11	10	9.8	9.0	8.2	7.5	6.6	5.3	3.4	2.2	Prone 1
		DC	6	6	6	6	5	5	5	5	4	4	4	3	2	2	
		BSHC	*6	*1	36	16	9	5	4	2	1	1	-2	-4	-7	-9	Collapse Radius 0
		BSCC	*10	*2	60	27	15	9	6	3	2	1	1	-2	-5	-7	
		BC	3K	530	95	43	25	17	13	8	5	4	3	2	1	1	
	0 - 1	ID	6	6	6	5	5	5	4	4	3	3	2	2			
	2 - 7	ID	12	12	11	11	10	10	9	8	8	7	6	4			
	8 - 9	ID	22	21	20	20	19	18	17	16	14	13	12	9			
		BSCC	5	1	-4	-7	-9	-11	-12	-14	-16	-17	-19	-21			
Burst on Rock	0 - 6	PEN	4.6	4.4	4.0	3.7	3.4	3.1	2.8	2.3	1.9	1.6	1.2	.8			Standing 4
		DC	2	2	2	2	2	2	1	1	1	1	1	1			Kneel/Fire Over 2
	7 - 8	PEN	9.1	8.9	8.4	7.9	7.5	7.1	6.7	6.0	5.4	4.8	4.1	3.1	1.8	1.0	Hands & Knees 1
		DC	4	4	4	4	4	3	3	3	3	3	2	2	1	1	Crawl 1
	9	PEN	13	12	12	11	11	10	9.8	9.0	8.2	7.5	6.6	5.3	3.4	2.2	Prone 1
		DC	6	6	6	6	5	5	5	5	4	4	4	3	2	2	
		BSHC	*9	*2	54	24	13	8	6	3	2	1	0	-3	-6	-8	Collapse Radius -
		BSCC	*10	*2	62	27	15	9	6	3	2	1	1	-2	-5	-7	
		BC	3K	539	130	57	34	24	17	11	7	6	4	2	1	1	
	0 - 1	ID	2	2	2	2	2	1	1	1	1	1					
	2 - 7	ID	4	4	3	3	3	3	2	2	2	1	1	1			
	8 - 9	ID	6	6	5	5	5	4	4	4	3	3	2	1			
		BSCC	9	2	-2	-5	-7	-9	-10	-12	-14	-15	-17	-19			
Burst on Sand or Ice	0 - 6	PEN	4.3	4.1	3.7	3.4	3.1	2.8	2.6	2.1	1.8	1.5	1.1	.7			Standing 6
		DC	2	2	2	2	2	1	1	1	1	1	1	1			Kneel/Fire Over 3
	7 - 8	PEN	5.3	5.2	4.9	4.6	4.3	4.0	3.8	3.3	2.9	2.6	2.1	1.6	.8		Hands & Knees 2
		DC	3	3	3	3	2	2	2	2	2	2	1	1	1		Crawl 1
	9	PEN	5.7	5.5	5.2	5.0	4.7	4.5	4.3	3.8	3.4	3.1	2.6	2.0	1.2	.7	Prone 1
		DC	3	3	3	3	3	3	3	3	2	2	2	2	1	1	
		BSHC	*3	78	19	8	4	3	2	1	-1	-3	-4	-6	-9	-11	Collapse Radius 2
		BSCC	*10	*3	64	28	16	10	7	4	2	1	1	-2	-5	-7	
		BC	3K	545	134	65	27	18	13	8	5	4	3	2	1	1	
Burst in a Flooded Rice Paddy	0 - 6	PEN	2.7	2.6	2.3	2.1	1.9	1.7	1.5	1.2	1.0	.8	.6				Standing 5
		DC	1	1	1	1	1	1	1	1	1	1	1				Kneel/Fire Over 3
	7 - 8	PEN	3.7	3.6	3.3	3.1	2.9	2.7	2.5	2.2	1.9	1.7	1.4	1.0	.5		Hands & Knees 2
		DC	2	2	2	2	2	2	2	1	1	1	1	1	1		Crawl 1
	9	PEN	4.1	4.0	3.8	3.6	3.4	3.2	3.0	2.7	2.4	2.1	1.8	1.4	.8	.4	Prone 1
		DC	3	3	2	2	2	2	2	2	2	2	1	1	1	1	
		BSHC	*2	51	12	5	3	2	1	-1	-3	-4	-6	-8	-11	-13	Collapse Radius 2
		BSCC	*10	*3	64	28	16	10	7	4	2	1	1	-2	-5	-7	
		BC	3K	546	134	65	24	15	11	6	4	3	2	1	1		

MORTAR BURST DATA TABLE

3 81mm HE
USA delay fuse

			Burst Data				Range from Burst in 2 yard hexes									Penetration and Critical Range	
			0	1	2	3	4	5	6	8	10	12	15	20	30	40	
Airburst	0 - 6	PEN	3.6	3.5	3.4	3.2	3.0	2.8	2.6	2.2	1.8	1.5	1.2	.7			PEN 11
		DC	2	2	2	2	1	1	1	1	1	1	1	1			PENF 3.1
	7 - 8	PEN	7.8	7.7	7.5	7.3	7.0	6.7	6.4	5.8	5.2	4.7	4.0	3.0	1.7	1.0	
		DC	4	4	4	4	3	3	3	3	3	3	2	2	1	1	BC Contact 97K
	9	PEN	11	11	11	11	10	9.8	9.5	8.7	8.0	7.4	6.5	5.2	3.4	2.2	
		DC	6	5	5	5	5	5	5	5	4	4	4	3	2	2	
		BSHC	24	22	18	13	10	7	5	3	2	1	1	-2	-5	-7	
		BC	54	51	42	33	26	20	16	11	8	6	3	3	1	1	
	0 - 1	ID	5	5	4	4	3	3	3	2	1	1					
	2 - 7	ID	7	7	7	6	6	5	5	4	3	2	1				
	8 - 9	ID	10	10	10	9	8	8	7	6	4	3	2	1			
		BSCC	1	1	1	1	-2	-3	-4	-5	-7	-8	-9	-11			
Burst on Earth	0 - 6	PEN	.9	.8	.7	.6	.5										Standing 4
		DC	1	1	1	1	1										Kneel/Fire Over 3
	7 - 8	PEN	1.4	1.3	1.2	1.1	1.0										Hands & Knees 2
		DC	1	1	1	1	1										Crawl 1
	9	PEN	1.6	1.6	1.5	1.4	1.3										Prone 1
		DC	1	1	1	1	1										
		BSHC															Collapse Radius 1
		BSCC	1	1	1	1	0										
		BC	3K	546	131	27	14	9	6	3	2	2	1	1			
	0 - 1	ID	2	1	1	1	1	1	1	1							
	2 - 7	ID	4	3	3	3	3	3	2	2	2	1	1	1			
	8 - 9	ID	7	7	6	6	6	5	5	4	4	3	3	2	1		
		BSCC	76	19	4	2	1	-1	-3	-5	-6	-8	-9	-11	-14		
Burst on Rock	0 - 6	PEN	4.6	4.4	4.0	3.7	3.4	3.1	2.8	2.3	1.9	1.6	1.2	.8			Standing 4
		DC	2	2	2	2	2	2	1	1	1	1	1	1			Kneel/Fire Over 2
	7 - 8	PEN	9.1	8.9	8.4	7.9	7.5	7.1	6.7	6.0	5.4	4.8	4.1	3.1	1.8	1.0	Hands & Knees 1
		DC	4	4	4	4	4	3	3	3	3	3	2	2	1	1	Crawl 1
	9	PEN	13	12	12	11	11	10	9.8	9.0	8.2	7.5	6.6	5.3	3.4	2.2	Prone 1
		DC	6	6	6	6	5	5	5	5	4	4	4	3	2	2	
		BSHC	*9	*2	54	24	13	8	6	3	2	1	0	-3	-6	-8	Collapse Radius -
		BSCC	*10	*2	62	27	15	9	6	3	2	1	1	-2	-5	-7	
		BC	3K	539	130	57	34	24	17	11	7	6	4	2	1	1	
	0 - 1	ID	2	2	2	2	2	1	1	1	1	1					
	2 - 7	ID	4	4	3	3	3	3	2	2	2	1	1	1			
	8 - 9	ID	6	6	5	5	5	4	4	4	3	3	2	1			
		BSCC	9	2	-2	-5	-7	-9	-10	-12	-14	-15	-17	-19			
Burst on Sand or Ice	0 - 6	PEN															Standing 2
		DC															Kneel/Fire Over 2
	7 - 8	PEN															Hands & Knees 1
		DC															Crawl 1
	9	PEN															Prone 1
		DC															
		BSHC															Collapse Radius 3
		BSCC	9	2													
		BC	4K	546	41	12	6	3	2	1	1	1					
Burst in a Flooded Rice Paddy	0 - 6	PEN															Standing 2
		DC															Kneel/Fire Over 1
	7 - 8	PEN															Hands & Knees 1
		DC															Crawl 1
	9	PEN															Prone 1
		DC															
		BSHC															Collapse Radius 3
		BSCC	9	2													
		BC	4K	491	22	6	3	2	1	1							

MORTAR BURST DATA TABLE

4 82mm HE USSR

			Burst Data	Range from Burst in 2 yard hexes												Penetration and Critical Range	
			0	1	2	3	4	5	6	8	10	12	15	20	30	40	
Airburst	0 - 6	PEN	4.1	4.1	4.0	3.8	3.6	3.3	3.1	2.7	2.3	2.0	1.6	1.1			PEN 7.5
		DC	2	2	2	2	2	2	2	1	1	1	1	1			PENF 1.7
	7 - 8	PEN	8.3	8.3	8.1	7.9	7.6	7.3	7.0	6.4	5.9	5.4	4.7	3.7	2.3	1.4	
		DC	4	4	4	4	4	4	4	4	3	3	3	2	2	1	BC Contact 40K
	9	PEN	7.4	7.4	7.3	7.1	6.9	6.6	6.4	5.9	5.5	5.1	4.5	3.6	2.4	1.6	
		DC	4	4	4	4	4	4	4	4	4	3	3	3	2	1	
		BSHC	16	15	12	9	6	5	3	2	1	1	-1	-3	-6	-8	
		BC	36	34	29	23	18	14	11	8	6	4	3	2	1	1	
	0 - 1	ID	5	5	4	4	4	3	3	2	1	1					
	2 - 7	ID	7	7	7	6	6	5	5	4	3	2	1				
	8 - 9	ID	10	10	10	9	8	8	7	6	4	4	2	1			
		BSCC	1	1	1	0	-2	-3	-4	-5	-7	-8	-9	-11			
Burst on Earth	0 - 6	PEN	5.2	5.0	4.6	4.2	3.9	3.6	3.4	2.9	2.4	2.1	1.7	1.1			Standing 2
		DC	2	2	2	2	2	2	2	2	1	1	1	1			Kneel/Fire Over 1
	7 - 8	PEN	8.4	8.2	7.8	7.4	7.1	6.7	6.4	5.8	5.2	4.8	4.1	3.2	1.9	1.2	Hands & Knees 1
		DC	4	4	4	4	4	4	4	3	3	3	3	2	1	1	Crawl 1
	9	PEN	7.6	7.4	7.1	6.8	6.5	6.2	6.0	5.5	5.0	4.6	4.0	3.3	2.1	1.4	Prone 0
		DC	5	4	4	4	4	4	4	4	3	3	3	2	2	1	
		BSHC	*3	87	21	9	5	3	2	1	0	-2	-4	-6	-9	-11	Collapse Radius -
		BSCC	*6	*1	35	15	8	5	3	2	1	0	-2	-4	-7	-9	
		BC	2K	296	54	25	15	10	8	5	3	2	2	1	1		
	0 - 1	ID	17	16	15	15	14	13	13	11	10						
	2 - 7	ID	29	29	27	26	25	24	23	21	20						
	8 - 9	ID	47	46	45	43	42	40	39	36	33						
		BSCC	1	-4	-9	-12	-14	-15	-17	-19	-20						
Burst on Rock	0 - 6	PEN	5.2	5.0	4.6	4.2	3.9	3.6	3.4	2.9	2.4	2.1	1.7	1.1			Standing 4
		DC	2	2	2	2	2	2	2	2	1	1	1	1			Kneel/Fire Over 2
	7 - 8	PEN	9.6	9.3	8.9	8.5	8.1	7.7	7.3	6.6	6.0	5.5	4.7	3.7	2.3	1.4	Hands & Knees 1
		DC	5	5	5	4	4	4	4	4	3	3	3	2	2	1	Crawl 1
	9	PEN	8.4	8.2	7.9	7.5	7.2	6.9	6.6	6.1	5.6	5.2	4.5	3.7	2.4	1.6	Prone 1
		DC	5	5	5	4	4	4	4	4	4	3	3	3	2	1	
		BSHC	*6	*1	36	16	9	5	4	2	1	1	-2	-4	-7	-9	Collapse Radius -
		BSCC	*6	*2	39	17	9	6	4	2	1	1	-2	-4	-7	-9	
		BC	2K	323	86	39	24	16	12	7	5	4	3	2	1	1	
	0 - 1	ID	2	2	1	1	1	1	1	1							
	2 - 7	ID	3	3	3	2	2	2	2	1	1	1	1				
	8 - 9	ID	5	4	4	4	4	3	3	3	2	2	1				
		BSCC	4	1	-5	-8	-10	-12	-13	-15	-17	-18	-20				
Burst on Sand or Ice	0 - 6	PEN	2.9	2.8	2.6	2.3	2.1	2.0	1.8	1.5	1.3	1.0	.8				Standing 4
		DC	2	2	1	1	1	1	1	1	1	1	1				Kneel/Fire Over 2
	7 - 8	PEN	3.4	3.3	3.1	3.0	2.8	2.6	2.5	2.2	1.9	1.7	1.4	1.1	.6		Hands & Knees 1
		DC	2	2	2	2	2	2	2	2	1	1	1	1	1		Crawl 1
	9	PEN	3.6	3.5	3.3	3.1	3.0	2.8	2.7	2.4	2.2	2.0	1.7	1.3	.8	.5	Prone 1
		DC	3	3	3	2	2	2	2	2	2	2	1	1	1	1	
		BSHC	*1	36	9	4	2	1	1	-3	-4	-5	-7	-9	-12	-14	Collapse Radius 0
		BSCC	*6	*2	39	17	9	6	4	2	1	1	-2	-4	-7	-9	
		BC	2K	324	86	24	13	9	6	4	3	2	1	1			
Burst in a Flooded Rice Paddy	0 - 6	PEN	2.0	1.9	1.7	1.6	1.4	1.3	1.2	1.0	.8	.7					Standing 4
		DC	1	1	1	1	1	1	1	1	1	1					Kneel/Fire Over 2
	7 - 8	PEN	2.6	2.5	2.3	2.2	2.1	1.9	1.8	1.6	1.4	1.2	1.0	.7			Hands & Knees 1
		DC	2	2	2	2	2	1	1	1	1	1	1	1			Crawl 1
	9	PEN	2.8	2.7	2.6	2.4	2.3	2.2	2.1	1.8	1.7	1.5	1.3	1.0	.6		Prone 1
		DC	2	2	2	2	2	2	2	2	1	1	1	1	1		
		BSHC	60	15	3	1	0	-2	-4	-6	-7	-9	-10	-12	-15		Collapse Radius 0
		BSCC	*6	*2	38	17	9	6	4	2	1	1	-2	-4	-7		
		BC	2K	322	85	18	10	6	4	3	2	1	1	1			

MORTAR BURST DATA TABLE

5 107mm HE USSR

			Burst Data	Range from Burst in 2 yard hexes												Penetration and Critical Range	
			0	1	2	3	4	5	6	8	10	12	15	20	30	40	
Airburst	0 - 6	PEN	11	11	11	11	10	10	9.7	9.0	8.3	7.6	6.7	5.4	3.5	2.3	PEN 15
		DC	6	6	6	5	5	5	5	5	4	4	4	3	2	2	PENF 5.3
	7 - 8	PEN	11	11	11	11	11	10	10	9.5	9.0	8.4	7.7	6.6	4.8	3.6	
		DC	7	7	7	6	6	6	6	6	6	6	6	5	4	3	BC Contact 102K
	9	PEN	9.9	9.9	9.8	9.6	9.4	9.2	9.0	8.6	8.2	7.7	7.2	6.3	4.8	3.6	
		DC	7	7	7	7	7	7	7	6	6	6	6	6	5	4	
		BSHC	5	4	3	2	2	1	1	-1	-3	-4	-5	-7	-10	-12	
		BC	55	52	43	34	27	21	17	11	8	6	5	3	2	1	
	0 - 1	ID	5	5	4	4	3	3	3	2	1	1					
	2 - 7	ID	7	7	7	6	6	5	5	4	3	2	1				
	8 - 9	ID	10	10	10	9	8	8	7	6	4	3	2	1			
		BSCC	2	2	1	1	0	-2	-2	-4	-6	-7	-8	-10			
Burst on Earth	0 - 6	PEN	13	13	12	12	11	11	10	9.3	8.5	7.8	6.8	5.5	3.6	2.3	Standing 2
		DC	6	6	6	6	6	5	5	5	4	4	4	3	2	2	Kneel/Fire Over 1
	7 - 8	PEN	11	11	11	10	9.9	9.6	9.3	8.7	8.1	7.6	6.9	5.9	4.3	3.1	Hands & Knees 1
		DC	7	6	6	6	6	6	6	6	6	6	5	5	4	3	Crawl 0
	9	PEN	9.9	9.7	9.5	9.2	9.0	8.7	8.5	8.0	7.6	7.2	6.6	5.7	4.3	3.3	Prone 0
		DC	7	7	7	7	7	7	6	6	6	6	6	5	4	4	
		BSHC	*1	28	7	3	1	1	-1	-3	-5	-6	-8	-10	-13	-15	Collapse Radius 0
		BSCC	*2	46	11	5	2	1	1	-2	-3	-5	-6	-8	-11	-13	
		BC	3K	513	85	38	23	15	11	7	5	4	2	2	1		
	0 - 1	ID	24	24	23	22	21	20	19	17	16	15	13				
	2 - 7	ID	42	41	40	38	37	36	34	32	29	27	24				
	8 - 9	ID	67	66	64	62	60	58	56	53	49	46	42				
		BSCC	4	1	-5	-8	-10	-11	-13	-15	-16	-18	-19				
Burst on Rock	0 - 6	PEN	13	13	12	12	11	11	10	9.3	8.5	7.8	6.8	5.5	3.6	2.3	Standing 3
		DC	6	6	6	6	6	5	5	5	4	4	4	3	2	2	Kneel/Fire Over 2
	7 - 8	PEN	12	12	12	11	11	11	10	9.7	9.1	8.6	7.8	6.7	4.9	3.6	Hands & Knees 1
		DC	7	7	7	7	7	6	6	6	6	6	6	5	4	3	Crawl 1
	9	PEN	11	11	10	10	9.8	9.5	9.2	8.8	8.3	7.8	7.2	6.3	4.8	3.6	Prone 0
		DC	7	7	7	7	7	7	7	7	6	6	6	6	5	4	
		BSHC	*2	44	11	4	2	1	1	-2	-3	-5	-6	-8	-11	-13	Collapse Radius -
		BSCC	*2	49	12	5	3	1	1	-1	-3	-4	-6	-8	-11	-13	
		BC	3K	550	119	56	34	23	17	11	7	5	4	2	1	1	
	0 - 1	ID	3	3	3	3	2	2	2	2	1	1	1				
	2 - 7	ID	5	5	5	4	4	4	4	3	3	2	2	1			
	8 - 9	ID	8	8	7	7	7	6	6	5	4	4	3	2	1		
		BSCC	11	2	-2	-5	-7	-8	-10	-12	-13	-14	-16	-18	-21		
Burst on Sand or Ice	0 - 6	PEN	5.1	5.0	4.7	4.5	4.2	4.0	3.8	3.4	3.1	2.8	2.3	1.8	1.1	.6	Standing 4
		DC	3	3	3	3	3	3	3	2	2	2	2	1	1	1	Kneel/Fire Over 3
	7 - 8	PEN	5.5	5.4	5.2	5.1	4.9	4.7	4.5	4.2	3.9	3.6	3.2	2.7	1.9	1.3	Hands & Knees 2
		DC	4	4	4	4	4	4	4	4	3	3	3	2	2	1	Crawl 1
	9	PEN	5.6	5.5	5.3	5.1	5.0	4.8	4.7	4.4	4.1	3.9	3.5	3.0	2.2	1.6	Prone 1
		DC	5	5	5	5	5	5	5	4	4	4	4	3	3	2	
		BSHC	57	14	3	1	0	-2	-4	-6	-7	-9	-10	-12	-15	-17	Collapse Radius 1
		BSCC	*2	51	12	5	3	2	1	-1	-3	-4	-6	-8	-11	-13	
		BC	3K	563	135	39	22	14	10	6	4	3	2	1	1		
Burst in a Flooded Rice Paddy	0 - 6	PEN	3.8	3.7	3.5	3.3	3.1	3.0	2.8	2.5	2.2	2.0	1.7	1.3	.7		Standing 4
		DC	3	2	2	2	2	2	2	2	2	2	1	1	1		Kneel/Fire Over 2
	7 - 8	PEN	4.5	4.4	4.2	4.0	3.9	3.7	3.6	3.3	3.1	2.8	2.5	2.1	1.4	1.0	Hands & Knees 1
		DC	4	4	4	3	3	3	3	3	3	3	2	2	1	1	Crawl 1
	9	PEN	4.6	4.5	4.4	4.2	4.1	4.0	3.8	3.6	3.4	3.2	2.9	2.4	1.7	1.3	Prone 1
		DC	5	5	4	4	4	4	4	4	4	4	3	3	2	1	
		BSHC	37	9	2	1	-2	-4	-5	-7	-9	-10	-12	-14	-17	-19	Collapse Radius 1
		BSCC	*2	50	12	5	3	2	1	-1	-3	-4	-6	-8	-11	-13	
		BC	3K	561	133	32	17	11	8	5	3	2	2	1			

6	107mm HE USA		Burst Data				Range from Burst in 2 yard hexes										Penetration and Critical Range	
			0	1	2	3	4	5	6	8	10	12	15	20	30	40		
Airburst	0 - 6	PEN	6.0	6.0	5.8	5.5	5.2	4.9	4.6	4.0	3.5	3.0	2.5	1.7	.8		PEN	25
		DC	3	3	3	3	2	2	2	2	2	2	1	1	1		PENF	9.6
	7 - 8	PEN	13	13	13	12	12	11	11	10	9.3	8.5	7.4	6.0	3.8	2.4		
		DC	6	6	6	6	6	5	5	5	5	4	4	3	2	2	BC Contact	441K
	9	PEN	18	18	18	17	17	16	16	15	14	13	12	9.9	6.9	4.8		
		DC	7	7	7	7	7	7	7	7	6	6	6	5	4	3		
		BSHC	36	33	27	20	15	11	8	5	3	2	1	1	-3	-5		
		BC	107	101	83	65	50	39	31	21	15	12	8	5	3	2		
	0 - 1	ID	5	5	4	4	3	3	3	2	1	1						
	2 - 7	ID	7	7	7	6	6	5	5	4	3	2	1					
	8 - 9	ID	10	10	10	9	8	8	7	6	4	3	2	1				
		BSCC	2	2	1	1	1	-1	-2	-4	-5	-6	-8	-10				
Burst on Earth	0 - 6	PEN	7.4	7.2	6.7	6.2	5.7	5.3	4.9	4.3	3.7	3.2	2.5	1.7	.8		Standing	4
		DC	3	3	3	3	3	2	2	2	2	2	1	1	1		Kneel/Fire Over	2
	7 - 8	PEN	15	14	14	13	12	12	11	10	9.5	8.7	7.6	6.0	3.8	2.4	Hands & Knees	1
		DC	6	6	6	6	6	6	5	5	5	4	4	3	2	2	Crawl	1
	9	PEN	20	20	19	18	18	17	16	15	14	13	12	9.9	6.9	4.8	Prone	1
		DC	7	7	7	7	7	7	7	7	6	6	6	5	4	3		
		BSHC	*10	*3	63	28	15	10	7	3	2	1	1	-2	-5	-7	Collapse Radius	1
		BSCC	*15	*4	94	42	23	15	10	5	3	2	1	0	-4	-6		
		BC	12K	1K	283	101	58	39	28	17	12	9	6	4	2	1		
	0 - 1	ID	6	6	5	5	5	4	4	3	3	3	2	1	1			
	2 - 7	ID	12	12	11	10	10	9	9	8	7	6	5	4	2	1		
	8 - 9	ID	22	21	20	19	19	18	17	16	14	13	11	9	6	4		
		BSCC	25	6	1	-2	-4	-5	-7	-9	-10	-12	-13	-15	-18	-20		
Burst on Rock	0 - 6	PEN	7.4	7.2	6.7	6.2	5.7	5.3	4.9	4.3	3.7	3.2	2.5	1.7	.8		Standing	3
		DC	3	3	3	3	3	2	2	2	2	2	1	1	1		Kneel/Fire Over	2
	7 - 8	PEN	15	14	14	13	12	12	11	10	9.5	8.7	7.6	6.0	3.8	2.4	Hands & Knees	1
		DC	6	6	6	6	6	6	5	5	5	4	4	3	2	2	Crawl	1
	9	PEN	20	20	19	18	18	17	16	15	14	13	12	9.9	6.9	4.8	Prone	1
		DC	7	7	7	7	7	7	7	7	6	6	6	5	4	3		
		BSHC	*13	*3	83	37	20	13	9	5	3	2	1	-1	-4	-6	Collapse Radius	0
		BSCC	*15	*4	94	42	23	15	10	5	3	2	1	0	-4	-6		
		BC	12K	1K	282	118	69	46	34	21	14	11	7	5	2	1		
	0 - 1	ID	1	1														
	2 - 7	ID	2	1	1	1	1	1	1	1								
	8 - 9	ID	3	3	3	2	2	2	2	1	1	1	1					
		BSCC	36	9	2	1	-2	-4	-5	-7	-9	-10	-12					
Burst on Sand or Ice	0 - 6	PEN	7.4	7.2	6.7	6.2	5.7	5.3	4.9	4.3	3.7	3.2	2.5	1.7	.8		Standing	7
		DC	3	3	3	3	3	2	2	2	2	2	1	1	1		Kneel/Fire Over	4
	7 - 8	PEN	15	14	14	13	12	12	11	10	9.5	8.7	7.6	6.0	3.8	2.4	Hands & Knees	3
		DC	6	6	6	6	6	6	5	5	5	4	4	3	2	2	Crawl	2
	9	PEN	20	20	19	18	18	17	16	15	14	13	12	9.9	6.9	4.8	Prone	2
		DC	7	7	7	7	7	7	7	7	6	6	6	5	4	3		
		BSHC	*8	*2	48	21	12	7	5	3	1	1	-1	-3	-6	-8	Collapse Radius	4
		BSCC	*16	*4	98	43	24	15	10	6	3	2	1	0	-3	-6		
		BC	12K	2K	295	133	78	42	30	18	12	9	6	4	2	1		
Burst in a Flooded Rice Paddy	0 - 6	PEN	7.4	7.2	6.7	6.2	5.7	5.3	4.9	4.3	3.7	3.2	2.5	1.7	.8		Standing	6
		DC	3	3	3	3	3	2	2	2	2	2	1	1	1		Kneel/Fire Over	4
	7 - 8	PEN	15	14	14	13	12	12	11	10	9.5	8.7	7.6	6.0	3.8	2.4	Hands & Knees	2
		DC	6	6	6	6	6	6	5	5	5	4	4	3	2	2	Crawl	2
	9	PEN	17	17	16	16	15	15	14	13	12	11	10	8.4	5.8	4.0	Prone	1
		DC	7	7	7	7	7	7	6	6	6	6	6	5	4	3		
		BSHC	*7	*2	42	18	10	6	4	2	1	1	-1	-4	-6	-9	Collapse Radius	4
		BSCC	*16	*4	97	43	24	15	10	6	3	2	1	0	-3	-6		
		BC	12K	2K	294	132	60	39	28	17	11	8	6	3	2	1		

MORTAR BURST DATA TABLE

7 120mm HE USSR

			Burst Data	Range from Burst in 2 yard hexes												Penetration and Critical Range	
			0	1	2	3	4	5	6	8	10	12	15	20	30	40	
Airburst	0 - 6	PEN	9.5	9.4	9.2	8.9	8.6	8.2	7.8	7.1	6.4	5.7	4.8	3.7	2.1	1.2	PEN 28
		DC	4	4	4	4	4	4	4	3	3	3	3	2	1	1	PENF 12
	7 - 8	PEN	20	20	19	19	19	18	17	16	15	14	13	11	7.9	5.6	
		DC	7	7	7	7	7	7	7	7	7	7	6	6	5	4	BC Contact 494K
	9	PEN	28	27	27	27	26	26	25	24	23	22	20	17	13	10	
		DC	9	9	9	9	9	9	8	8	8	8	8	8	7	6	
		BSHC	33	31	25	18	14	10	8	5	3	2	1	0	-4	-6	
		BC	113	107	87	68	52	41	33	22	16	12	9	6	3	2	
	0 - 1	ID	5	5	4	4	3	3	3	2	1	1					
	2 - 7	ID	7	7	7	6	6	5	5	4	3	2	1				
	8 - 9	ID	10	10	10	9	8	8	7	6	4	3	2	1			
		BSCC	2	2	2	1	1	0	-2	-3	-5	-6	-8	-10			
Burst on Earth	0 - 6	PEN	11	11	10	9.7	9.2	8.7	8.2	7.3	6.5	5.9	4.9	3.7	2.1	1.2	Standing 3
		DC	5	5	4	4	4	4	4	3	3	3	3	2	1	1	Kneel/Fire Over 2
	7 - 8	PEN	22	21	21	20	19	19	18	17	16	15	13	11	7.9	5.6	Hands & Knees 1
		DC	8	8	8	7	7	7	7	7	7	7	6	6	5	4	Crawl 1
	9	PEN	30	29	29	28	27	26	26	24	23	22	20	18	13	10	Prone 1
		DC	9	9	9	9	9	9	9	8	8	8	8	8	7	6	
		BSHC	*10	*2	60	26	15	9	6	3	2	1	1	-2	-5	-7	Collapse Radius 1
		BSCC	*14	*3	87	38	21	13	9	5	3	2	1	0	-4	-6	
		BC	13K	2K	296	106	61	41	30	18	12	9	6	4	2	1	
	0 - 1	ID	7	7	6	6	6	5	5	4	4	3	3	2	1		
	2 - 7	ID	14	14	13	13	12	11	11	10	9	8	7	5	3	2	
	8 - 9	ID	26	25	24	23	22	21	20	19	17	16	14	11	7	5	
		BSCC	25	6	1	-2	-4	-5	-7	-9	-10	-12	-13	-15	-18	-20	
Burst on Rock	0 - 6	PEN	11	11	10	9.7	9.2	8.7	8.2	7.3	6.5	5.9	4.9	3.7	2.1	1.2	Standing 3
		DC	5	5	4	4	4	4	4	3	3	3	3	2	1	1	Kneel/Fire Over 2
	7 - 8	PEN	22	21	21	20	19	19	18	17	16	15	13	11	7.9	5.6	Hands & Knees 1
		DC	8	8	8	7	7	7	7	7	7	7	6	6	5	4	Crawl 1
	9	PEN	30	29	29	28	27	26	26	24	23	22	20	18	13	10	Prone 1
		DC	9	9	9	9	9	9	9	8	8	8	8	8	7	6	
		BSHC	*13	*3	78	34	19	12	8	4	3	2	1	-1	-4	-6	Collapse Radius 0
		BSCC	*14	*4	87	39	21	14	9	5	3	2	1	0	-4	-6	
		BC	13K	2K	284	124	73	49	36	22	15	11	8	5	2	2	
	0 - 1	ID	1	1	1	1											
	2 - 7	ID	2	2	2	1	1	1	1	1	1						
	8 - 9	ID	3	3	3	3	3	2	2	2	1	1	1				
		BSCC	41	10	2	1	-2	-4	-5	-7	-9	-10	-11				
Burst on Sand or Ice	0 - 6	PEN	11	11	10	9.7	9.2	8.7	8.2	7.3	6.5	5.9	4.9	3.7	2.1	1.2	Standing 6
		DC	5	5	4	4	4	4	4	3	3	3	3	2	1	1	Kneel/Fire Over 4
	7 - 8	PEN	22	21	21	20	19	19	18	17	16	15	13	11	7.9	5.6	Hands & Knees 2
		DC	8	8	8	7	7	7	7	7	7	7	6	6	5	4	Crawl 2
	9	PEN	30	29	29	28	27	26	26	24	23	22	20	18	13	10	Prone 1
		DC	9	9	9	9	9	9	9	8	8	8	8	8	7	6	
		BSHC	*8	*2	46	20	11	7	5	2	1	1	-1	-3	-6	-8	Collapse Radius 4
		BSCC	*15	*4	90	40	22	14	10	5	3	2	1	0	-4	-6	
		BC	13K	2K	314	140	66	43	31	19	13	9	6	4	2	1	
Burst in a Flooded Rice Paddy	0 - 6	PEN	11	11	10	9.7	9.2	8.7	8.2	7.3	6.5	5.9	4.9	3.7	2.1	1.2	Standing 6
		DC	5	5	4	4	4	4	4	3	3	3	3	2	1	1	Kneel/Fire Over 4
	7 - 8	PEN	21	21	20	20	19	18	18	17	16	14	13	11	7.8	5.5	Hands & Knees 2
		DC	8	8	8	7	7	7	7	7	7	7	6	6	5	4	Crawl 2
	9	PEN	21	20	20	19	19	18	18	17	16	15	14	12	8.7	6.5	Prone 1
		DC	8	8	8	8	8	8	8	7	7	7	7	7	6	5	
		BSHC	*7	*2	42	18	10	6	4	2	1	1	-2	-4	-6	-9	Collapse Radius 4
		BSCC	*14	*4	90	40	22	14	10	5	3	2	1	0	-4	-6	
		BC	13K	2K	313	139	61	40	29	17	12	8	6	4	2	1	

8 160mm HE USSR

			Burst Data	Range from Burst in 2 yard hexes												Penetration and Critical Range
			0	1	2	3	4	5	6	8	10	12	15	20	30	40	
Airburst	0 - 6	PEN	25	24	24	24	23	23	22	21	20	18	17	14	11	7.8	PEN 50
		DC	8	8	8	8	8	8	8	8	8	7	7	7	6	5	PENF 24
	7 - 8	PEN	38	38	38	37	37	36	36	34	33	32	30	27	22	18	
		DC	10	10	10	10	10	10	10	10	10	10	9	9	9	8	BC Contact 1043K
	9	PEN	34	34	34	33	33	32	32	31	30	29	27	25	21	18	
		DC	10	10	10	10	10	10	10	10	10	10	10	10	9	9	
		BSHC	27	25	20	15	11	8	6	4	2	2	1	-1	-4	-6	
		BC	163	154	124	96	73	57	45	30	22	17	12	8	4	2	
	0 - 1	ID	5	5	4	4	3	3	3	2	1	1					
	2 - 7	ID	7	7	7	6	6	5	5	4	3	2	1				
	8 - 9	ID	10	10	10	9	8	8	7	5	4	3	2	1			
		BSCC	4	3	3	2	1	1	0	-2	-4	-5	-6	-8			
Burst on Earth	0 - 6	PEN	27	26	26	25	24	23	23	21	20	19	17	15	11	7.8	Standing 3
		DC	8	8	8	8	8	8	8	8	8	7	7	7	6	5	Kneel/Fire Over 2
	7 - 8	PEN	41	40	39	39	38	37	36	35	33	32	30	27	22	18	Hands & Knees 1
		DC	10	10	10	10	10	10	10	10	10	10	9	9	9	8	Crawl 1
	9	PEN	36	35	35	34	33	33	32	31	30	29	27	25	21	18	Prone 1
		DC	10	10	10	10	10	10	10	10	10	10	10	10	9	9	
		BSHC	*8	*2	49	21	12	7	5	3	1	1	0	-3	-6	-8	Collapse Radius 2
		BSCC	*11	*3	69	30	17	11	7	4	2	1	1	-2	-5	-7	
		BC	27K	3K	380	152	85	56	40	24	17	12	8	5	3	2	
	0 - 1	ID	15	15	14	14	13	12	12	11	10	9	7	6	3	2	
	2 - 7	ID	30	29	28	27	26	25	24	22	20	19	16	13	9	6	
	8 - 9	ID	52	51	49	47	46	44	43	40	37	35	31	26	18	13	
		BSCC	36	9	2	1	-3	-4	-5	-8	-9	-10	-12	-14	-17	-19	
Burst on Rock	0 - 6	PEN	27	26	26	25	24	23	23	21	20	19	17	15	11	7.8	Standing 3
		DC	8	8	8	8	8	8	8	8	8	7	7	7	6	5	Kneel/Fire Over 2
	7 - 8	PEN	41	40	39	39	38	37	36	35	33	32	30	27	22	18	Hands & Knees 1
		DC	10	10	10	10	10	10	10	10	10	10	9	9	9	8	Crawl 1
	9	PEN	36	35	35	34	33	33	32	31	30	29	27	25	21	18	Prone 1
		DC	10	10	10	10	10	10	10	10	10	10	10	10	9	9	
		BSHC	*10	*3	62	27	15	10	6	3	2	1	1	-2	-5	-7	Collapse Radius 1
		BSCC	*11	*3	70	31	17	11	7	4	2	1	1	-2	-5	-7	
		BC	26K	3K	436	179	102	68	49	30	20	15	10	6	3	2	
	0 - 1	ID	3	3	3	3	2	2	2	2	1	1	1				
	2 - 7	ID	6	5	5	5	4	4	4	3	3	2	2	1			
	8 - 9	ID	9	9	8	8	7	7	6	6	5	4	4	3	1		
		BSCC	79	19	4	2	1	-1	-3	-5	-6	-8	-9	-11	-14		
Burst on Sand or Ice	0 - 6	PEN	27	26	26	25	24	23	23	21	20	19	17	15	11	7.8	Standing 6
		DC	8	8	8	8	8	8	8	8	8	7	7	7	6	5	Kneel/Fire Over 4
	7 - 8	PEN	41	40	39	39	38	37	36	35	33	32	30	27	22	18	Hands & Knees 2
		DC	10	10	10	10	10	10	10	10	10	10	9	9	9	8	Crawl 2
	9	PEN	36	35	35	34	33	33	32	31	30	29	27	25	21	18	Prone 1
		DC	10	10	10	10	10	10	10	10	10	10	10	10	9	9	
		BSHC	*6	*2	39	17	9	6	4	2	1	1	-2	-4	-7	-9	Collapse Radius 5
		BSCC	*12	*3	73	32	18	11	8	4	2	2	1	-2	-5	-7	
		BC	26K	3K	485	203	91	58	42	25	17	12	8	5	3	2	
Burst in a Flooded Rice Paddy	0 - 6	PEN	27	26	26	25	24	23	23	21	20	19	17	15	11	7.8	Standing 5
		DC	8	8	8	8	8	8	8	8	8	7	7	7	6	5	Kneel/Fire Over 3
	7 - 8	PEN	33	33	32	31	31	30	29	28	27	26	24	22	18	14	Hands & Knees 2
		DC	10	10	10	10	10	9	9	9	9	9	9	9	8	8	Crawl 1
	9	PEN	30	30	29	29	28	28	27	26	25	24	23	21	17	14	Prone 1
		DC	10	10	10	10	10	10	10	10	10	10	9	9	9	8	
		BSHC	*6	*1	36	16	9	5	4	2	1	1	-2	-4	-7	-9	Collapse Radius 4
		BSCC	*12	*3	72	32	18	11	8	4	2	2	1	-2	-5	-7	
		BC	26K	3K	482	201	84	54	38	23	15	11	8	5	2	2	

MORTAR BURST DATA TABLE

9 240mm HE USSR

			Burst Data	Range from Burst in 2 yard hexes												Penetration and Critical Range	
			0	1	2	3	4	5	6	8	10	12	15	20	30	40	
Airburst	0 - 6	PEN	46	46	46	45	44	44	43	41	39	37	35	31	25	20	PEN 114
		DC	10	10	10	10	10	10	10	10	10	9	9	9	9	8	PENF 59
	7 - 8	PEN	92	92	91	91	90	89	88	85	83	81	77	72	62	54	
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	BC Contact 6327K
	9	PEN	84	84	83	82	82	81	80	78	76	75	72	68	60	53	
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
		BSHC	28	27	21	16	12	9	6	4	3	2	1	-1	-4	-6	
		BC	447	416	324	239	175	132	103	67	48	36	25	16	8	5	
	0 - 1	ID	5	4	4	4	3	3	3	2	1	1					
	2 - 7	ID	7	7	7	6	6	5	4	3	3	2	1				
	8 - 9	ID	10	10	10	9	8	7	7	5	4	3	2	1			
		BSCC	6	6	4	3	2	2	1	0	-2	-3	-5	-7			
Burst on Earth	0 - 6	PEN	50	49	48	47	46	45	44	42	40	38	35	31	25	20	Standing 4
		DC	10	10	10	10	10	10	10	10	10	10	9	9	9	8	Kneel/Fire Over 2
	7 - 8	PEN	96	95	94	93	91	90	89	86	84	81	78	72	63	54	Hands & Knees 2
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	Crawl 1
	9	PEN	87	86	85	84	83	82	81	79	77	75	72	68	60	53	Prone 1
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
		BSHC	*9	*2	59	26	14	9	6	3	2	1	1	-2	-5	-7	Collapse Radius 5
		BSCC	*12	*3	75	33	18	12	8	4	3	2	1	-2	-4	-6	
		BC	149K	14K	2K	490	248	153	106	61	41	30	20	13	6	4	
	0 - 1	ID	32	31	30	28	27	26	25	23	21	19	17	14	9	6	
	2 - 7	ID	60	59	57	55	53	51	50	46	43	40	36	30	22	15	
	8 - 9	ID	103	101	98	96	93	90	87	82	78	73	67	58	43	32	
		BSCC	92	23	5	2	1	0	-2	-4	-6	-7	-9	-11	-14	-16	
Burst on Rock	0 - 6	PEN	50	49	48	47	46	45	44	42	40	38	35	31	25	20	Standing 4
		DC	10	10	10	10	10	10	10	10	10	10	9	9	9	8	Kneel/Fire Over 3
	7 - 8	PEN	96	95	94	93	91	90	89	86	84	81	78	72	63	54	Hands & Knees 2
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	Crawl 1
	9	PEN	87	86	85	84	83	82	81	79	77	75	72	68	60	53	Prone 1
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
		BSHC	*11	*3	69	30	17	11	7	4	2	1	1	-2	-5	-7	Collapse Radius 3
		BSCC	*12	*3	76	34	19	12	8	4	3	2	1	-1	-4	-6	
		BC	146K	14K	2K	543	277	172	119	69	46	34	23	14	7	5	
	0 - 1	ID	5	5	4	4	4	4	3	3	2	2	1	1			
	2 - 7	ID	9	9	8	8	7	7	6	5	5	4	3	2	1		
	8 - 9	ID	14	14	13	12	12	11	11	9	8	8	6	5	3	1	
		BSCC	*3	69	17	7	4	2	1	1	-2	-3	-5	-7	-10	-12	
Burst on Sand or Ice	0 - 6	PEN	50	49	48	47	46	45	44	42	40	38	35	31	25	20	Standing 6
		DC	10	10	10	10	10	10	10	10	10	10	9	9	9	8	Kneel/Fire Over 4
	7 - 8	PEN	96	95	94	93	91	90	89	86	84	81	78	72	63	54	Hands & Knees 2
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	Crawl 2
	9	PEN	87	86	85	84	83	82	81	79	77	75	72	68	60	53	Prone 2
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
		BSHC	*3	*2	53	23	13	8	5	3	2	1	0	-3	-6	-8	Collapse Radius 9
		BSCC	*12	*3	77	34	19	12	8	4	3	2	1	-1	-4	-6	
		BC	145K	14K	2K	585	260	159	109	63	42	30	21	13	6	4	
Burst in a Flooded Rice Paddy	0 - 6	PEN	50	49	48	47	46	45	44	42	40	38	35	31	25	20	Standing 5
		DC	10	10	10	10	10	10	10	10	10	10	9	9	9	8	Kneel/Fire Over 3
	7 - 8	PEN	96	95	94	93	91	90	89	86	84	81	78	72	63	54	Hands & Knees 2
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	Crawl 2
	9	PEN	87	86	85	84	83	82	81	79	77	75	72	68	60	53	Prone 1
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
		BSHC	*8	*2	51	22	12	8	5	3	2	1	0	-3	-6	-8	Collapse Radius 8
		BSCC	*12	*3	77	34	19	12	8	4	3	2	1	-1	-4	-6	
		BC	146K	14K	2K	581	247	151	104	60	40	29	20	12	6	4	

ROCKET BURST DATA TABLE

10 140mm HE USSR rocket

			Burst Data: Range from Burst in 2 yard hexes														Penetration and Critical Range	
			0	1	2	3	4	5	6	8	10	12	15	20	30	40		
Airburst	0 - 6	PEN	2.8	2.8	2.7	2.5	2.2	2.0	1.8	1.5	1.1	.9	.6				PEN	25
		DC	1	1	1	1	1	1	1	1	1	1	1				PENF	8.6
	7 - 8	PEN	6.5	6.4	6.2	6.0	5.7	5.3	5.0	4.4	3.8	3.3	2.6	1.8	.9			
		DC	3	3	3	3	3	2	2	2	2	2	1	1	1		BC Contact	852K
	9	PEN	9.4	9.3	9.1	8.8	8.4	8.0	7.6	6.8	6.1	5.5	4.6	3.5	1.9	1.1		
		DC	4	4	4	4	4	4	3	3	3	3	2	2	1	1		
		BSHC	66	62	49	37	27	20	16	10	6	4	3	1	-1	-3		
		BC	148	139	113	87	67	52	42	28	20	15	11	7	4	2		
	0 - 1	ID	5	5	4	4	3	3	3	2	1	1						
	2 - 7	ID	7	7	7	6	6	5	5	4	3	2	1					
	8 - 9	ID	10	10	10	9	8	8	7	5	4	3	2	1				
		BSCC	3	3	2	1	1	1	-1	-3	-4	-5	-7	-9				
Burst on Earth	0 - 6	PEN	4.1	3.8	3.4	3.0	2.6	2.3	2.0	1.6	1.2	1.0	.7				Standing	3
		DC	2	2	1	1	1	1	1	1	1	1	1				Kneel/Fire Over	2
	7 - 8	PEN	8.0	7.7	7.2	6.7	6.2	5.7	5.3	4.6	3.9	3.4	2.7	1.9	.9		Hands & Knees	1
		DC	3	3	3	3	3	3	2	2	2	2	1	1	1		Crawl	1
	9	PEN	11	11	10	9.6	9.0	8.5	8.0	7.1	6.3	5.6	4.7	3.5	1.9	1.1	Prone	1
		DC	5	4	4	4	4	4	4	3	3	3	2	2	1	1		
		BSHC	*25	*6	*2	69	39	25	17	9	6	4	2	1	-2	-4	Collapse Radius	1
		BSCC	*29	*7	*2	79	44	28	19	11	7	4	3	1	-1	-3		
		BC	22K	2K	410	164	94	63	46	28	19	14	10	6	3	2		
	0 - 1	ID	6	5	5	5	4	4	4	3	3	2	2	1				
	2 - 7	ID	12	11	11	10	10	9	9	8	7	6	5	4	2			
	8 - 9	ID	21	20	20	19	18	17	16	15	14	13	11	9	6			
		BSCC	16	4	1	-3	-5	-7	-8	-10	-12	-13	-15	-17	-20			
Burst on Rock	0 - 6	PEN	4.1	3.8	3.4	3.0	2.6	2.3	2.0	1.6	1.2	1.0	.7				Standing	5
		DC	2	2	1	1	1	1	1	1	1	1	1				Kneel/Fire Over	3
	7 - 8	PEN	8.0	7.7	7.2	6.7	6.2	5.7	5.3	4.6	3.9	3.4	2.7	1.9	.9		Hands & Knees	2
		DC	3	3	3	3	3	3	2	2	2	2	1	1	1		Crawl	1
	9	PEN	11	11	10	9.6	9.0	8.5	8.0	7.1	6.3	5.6	4.7	3.5	1.9	1.1	Prone	1
		DC	5	4	4	4	4	4	4	3	3	3	2	2	1	1		
		BSHC	*28	*7	*2	76	43	27	19	10	6	4	3	1	-1	-3	Collapse Radius	1
		BSCC	*29	*7	*2	80	45	29	20	11	7	5	3	1	-1	-3		
		BC	21K	2K	426	178	103	69	50	30	21	15	11	7	3	2		
	0 - 1	ID																
	2 - 7	ID																
	8 - 9	ID	1	1	1													
		BSCC	47	11	2													
Burst on Sand or Ice	0 - 6	PEN	4.1	3.8	3.4	3.0	2.6	2.3	2.0	1.6	1.2	1.0	.7				Standing	6
		DC	2	2	1	1	1	1	1	1	1	1	1				Kneel/Fire Over	4
	7 - 8	PEN	8.0	7.7	7.2	6.7	6.2	5.7	5.3	4.6	3.9	3.4	2.7	1.9	.9		Hands & Knees	2
		DC	3	3	3	3	3	3	2	2	2	2	1	1	1		Crawl	1
	9	PEN	11	11	10	9.6	9.0	8.5	8.0	7.1	6.3	5.6	4.7	3.5	1.9	1.1	Prone	1
		DC	5	4	4	4	4	4	4	3	3	3	2	2	1	1		
		BSHC	*23	*6	*1	64	36	23	16	9	5	4	2	1	-2	-4	Collapse Radius	3
		BSCC	*29	*7	*2	81	45	29	20	11	7	5	3	1	-1	-3		
		BC	21K	2K	429	183	96	63	46	28	19	14	10	6	3	2		
Burst in a Flooded Rice Paddy	0 - 6	PEN	4.1	3.8	3.4	3.0	2.6	2.3	2.0	1.6	1.2	1.0	.7				Standing	5
		DC	2	2	1	1	1	1	1	1	1	1	1				Kneel/Fire Over	3
	7 - 8	PEN	8.0	7.7	7.2	6.7	6.2	5.7	5.3	4.6	3.9	3.4	2.7	1.9	.9		Hands & Knees	2
		DC	3	3	3	3	3	3	2	2	2	2	1	1	1		Crawl	1
	9	PEN	11	11	10	9.6	9.0	8.5	8.0	7.1	6.3	5.6	4.7	3.5	1.9	1.1	Prone	1
		DC	5	4	4	4	4	4	4	3	3	3	2	2	1	1		
		BSHC	*22	*6	*1	62	35	22	15	8	5	3	2	1	-2	-4	Collapse Radius	3
		BSCC	*29	*7	*2	80	45	29	20	11	7	5	3	1	-1	-3		
		BC	21K	3K	427	182	93	61	44	27	18	14	9	6	3	2		

ARTILLERY BURST DATA TABLE

1 76mm HE USSR

			Burst Data				Range from Burst in 2 yard hexes									
			0	1	2	3	4	5	6	8	10	12	15	20	30	40
Airburst	0 - 6	PEN	8.0	8.0	7.9	7.8	7.6	7.4	7.2	6.9	6.5	6.1	5.6	4.9	3.7	2.7
		DC	6	6	6	6	6	6	6	6	6	6	5	5	4	3
	7 - 8	PEN	6.2	6.2	6.1	6.0	5.9	5.8	5.7	5.5	5.3	5.1	4.8	4.3	3.4	2.8
		DC	10	10	10	10	10	9	9	9	9	9	9	8	7	6
	9	PEN	5.5	5.5	5.4	5.4	5.3	5.2	5.1	4.9	4.8	4.6	4.3	3.9	3.3	2.7
		DC	10	10	10	10	10	10	10	10	10	10	10	10	9	7
		BSHC	3	3	2	2	1	1	-1	-3	-4	-5	-7	-9	-12	-14
		BC	46	44	37	29	22	18	14	10	7	5	4	2	1	1
	0 - 1	ID	5	5	5	4	4	4	3	3	2	2	1	1		
	2 - 7	ID	8	8	7	7	6	6	5	4	3	3	2	1		
	8 - 9	ID	11	11	10	10	9	8	7	6	5	4	3	2	1	
		BSCC	1	1	0	0	-1	-2	-3	-5	-6	-8	-9	-11	-14	
Burst on Earth	0 - 6	PEN	3.9	3.8	3.7	3.5	3.4	3.3	3.2	3.0	2.8	2.6	2.3	2.0	1.4	1.0
		DC	4	4	4	4	4	4	3	3	3	3	3	2	2	1
	7 - 8	PEN	3.8	3.8	3.7	3.6	3.5	3.4	3.3	3.2	3.0	2.9	2.7	2.4	1.8	1.4
		DC	8	8	8	8	8	7	7	7	7	7	6	5	3	2
	9	PEN	3.7	3.7	3.6	3.5	3.4	3.4	3.3	3.2	3.0	2.9	2.7	2.4	2.0	1.6
		DC	9	9	9	9	9	9	9	8	8	8	7	6	3	2
		BSHC	36	9	2	1	-2	-4	-5	-7	-9	-10	-11	-14	-16	-19
		BSCC	*1	32	8	4	2	1	1	-2	-4	-5	-7	-9	-12	-14
		BC	3K	441	67	28	16	10	7	4	3	2	2	1		
	0 - 1	ID	3	3	3	2	2	2	2	2	1	1	1	1		
	2 - 7	ID	6	5	5	5	5	4	4	4	3	3	2	2	1	1
	8 - 9	ID	10	10	9	9	8	8	7	7	6	6	5	4	2	1
		BSCC	21	4	0	-2	-4	-6	-7	-9	-11	-12	-14	-16	-18	-21
Burst on Rock	0 - 6	PEN	8.7	8.6	8.3	8.1	7.9	7.6	7.4	7.0	6.6	6.2	5.7	4.9	3.7	2.7
		DC	6	6	6	6	6	6	6	6	6	6	5	5	4	3
	7 - 8	PEN	6.6	6.5	6.4	6.2	6.1	6.0	5.8	5.6	5.3	5.1	4.8	4.3	3.4	2.8
		DC	10	10	10	10	10	10	9	9	9	9	9	8	7	6
	9	PEN	5.8	5.7	5.6	5.5	5.4	5.3	5.2	5.0	4.8	4.6	4.4	4.0	3.3	2.7
		DC	10	10	10	10	10	10	10	10	10	10	10	10	9	7
		BSHC	93	23	5	3	1	1	-2	-4	-5	-7	-8	-10	-13	-15
		BSCC	*1	30	7	3	2	1	-1	-3	-4	-6	-7	-9	-12	-14
		BC	2K	376	82	39	24	16	12	7	5	4	3	2	1	1
	0 - 1	ID	5	5	5	4	4	4	4	3	3	2	2	1	1	
	2 - 7	ID	8	8	8	7	7	6	6	5	5	4	3	3	1	
	8 - 9	ID	12	12	11	11	10	10	9	8	7	7	6	4	2	
		BSCC	13	2	-1	-4	-6	-7	-9	-11	-12	-14	-15	-17	-20	
Burst on Sand or Ice	0 - 6	PEN	2.4	2.4												
		DC	3	3												
	7 - 8	PEN	2.7	2.7												
		DC	6	6												
	9	PEN	2.8	2.7												
		DC	7	7												
		BSHC														
		BSCC	13	2												
		BC	2K	447	115	56	21	13	9	5	3	2	2	1	1	
Burst in a Flooded Rice Paddy	0 - 6	PEN	2.0	1.9												
		DC	2	2												
	7 - 8	PEN	2.3	2.3												
		DC	5	5												
	9	PEN	2.4	2.4												
		DC	6	6												
		BSHC														
		BSCC	13	2												
		BC	2K	449	114	30	16	10	7	4	3	2	1	1		

Penetration and Critical Range	
PEN	19
PENF	8.4
BC Contact	70K
Standing	3
Kneel/Fire Over	2
Hands & Knees	1
Crawl	1
Prone	1
Collapse Radius	1
Standing	2
Kneel/Fire Over	1
Hands & Knees	1
Crawl	0
Prone	0
Collapse Radius	0
Standing	6
Kneel/Fire Over	4
Hands & Knees	2
Crawl	2
Prone	1
Collapse Radius	2
Standing	4
Kneel/Fire Over	3
Hands & Knees	2
Crawl	1
Prone	1
Collapse Radius	2

2	25 pound HE UK		Burst Data	Range from Burst in 2 yard hexes												Penetration and Critical Range	
			0	1	2	3	4	5	6	8	10	12	15	20	30	40	
Airburst	0 - 6	PEN	12	12	12	12	12	11	11	11	10	9.8	9.1	8.1	6.3	5.0	PEN 34
		DC	8	8	8	8	8	7	7	7	7	7	7	7	6	6	PENF 17
	7 - 8	PEN	9.4	9.4	9.3	9.2	9.1	8.9	8.8	8.5	8.2	7.9	7.5	6.9	5.7	4.8	
		DC	9	9	9	9	9	9	9	9	9	9	9	9	9	8	BC Contact 159K
	9	PEN	8.3	8.3	8.2	8.1	8.0	7.9	7.8	7.6	7.4	7.1	6.8	6.3	5.4	4.6	
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
		BSHC	4	4	3	2	2	1	1	-2	-3	-4	-6	-8	-11	-13	
		BC	67	64	53	41	32	25	20	14	10	8	5	3	2	1	
	0 - 1	ID	5	5	5	4	4	4	3	3	2	2	1	1			
	2 - 7	ID	8	8	7	7	6	6	5	4	3	3	2	1			
	8 - 9	ID	11	11	10	10	9	8	7	6	5	4	3	2	1		
		BSCC	1	1	1	0	-1	-2	-3	-4	-6	-7	-8	-10	-13		
Burst on Earth	0 - 6	PEN	4.8	4.7	4.6	4.4	4.3	4.2	4.0	3.8	3.6	3.4	3.1	2.6	2.0	1.4	Standing 4
		DC	5	5	5	5	5	6	5	5	5	4	4	4	3	2	Kneel/Fire Over 2
	7 - 8	PEN	5.0	4.9	4.8	4.7	4.6	4.5	4.4	4.2	4.1	3.9	3.7	3.3	2.7	2.1	Hands & Knees 1
		DC	10	10	10	10	10	10	10	9	9	9	9	8	7	5	Crawl 1
	9	PEN	4.9	4.9	4.8	4.7	4.6	4.5	4.4	4.3	4.1	4.0	3.8	3.4	2.9	2.4	Prone 1
		DC	10	10	10	10	10	10	10	10	10	10	10	10	8	5	
		BSHC	31	8	2	-1	-3	-4	-6	-8	-9	-10	-12	-14	-17	-19	Collapse Radius 2
		BSCC	*2	40	10	4	3	2	1	-2	-3	-5	-6	-8	-11	-13	
		BC	5K	745	167	42	23	15	10	6	4	3	2	1	1		
	0 - 1	ID	3	3	3	3	3	2	2	2	2	1	1	1			
	2 - 7	ID	7	6	6	6	5	5	5	4	4	3	3	2	1	1	
	8 - 9	ID	12	11	11	10	10	9	9	8	7	7	6	4	3	2	
		BSCC	56	13	3	1	0	-2	-3	-5	-6	-8	-10	-12	-15	-17	
Burst on Rock	0 - 6	PEN	13	13	13	12	12	12	11	11	10	9.9	9.2	8.1	6.4	5.0	Standing 2
		DC	8	8	8	8	8	8	7	7	7	7	7	7	6	6	Kneel/Fire Over 1
	7 - 8	PEN	9.9	9.8	9.6	9.4	9.3	9.1	8.9	8.6	8.3	8.0	7.6	6.9	5.7	4.8	Hands & Knees 1
		DC	9	9	9	9	9	9	9	9	9	9	9	9	9	8	Crawl 0
	9	PEN	8.7	8.6	8.4	8.3	8.2	8.1	7.9	7.7	7.4	7.2	6.9	6.3	5.4	4.6	Prone 0
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
		BSHC	*1	26	6	3	2	1	-1	-3	-5	-6	-8	-10	-13	-15	Collapse Radius 0
		BSCC	*1	37	9	4	2	1	1	-2	-4	-5	-6	-8	-11	-13	
		BC	5K	664	117	54	32	22	16	10	7	5	3	2	1	1	
	0 - 1	ID	4	4	4	3	3	3	3	2	2	2	1	1			
	2 - 7	ID	7	6	6	6	5	5	5	4	3	3	3	2	1		
	8 - 9	ID	10	10	9	9	8	8	7	6	6	5	4	3	2	1	
		BSCC	35	8	1	0	-2	-4	-5	-7	-9	-10	-12	-14	-17	-19	
Burst on Sand or Ice	0 - 6	PEN	3.3	3.2	3.1	3.0	2.9										Standing 6
		DC	4	4	4	4	4										Kneel/Fire Over 4
	7 - 8	PEN	3.7	3.7	3.6	3.5	3.5										Hands & Knees 3
		DC	9	9	9	9	9										Crawl 2
	9	PEN	3.8	3.8	3.7	3.7	3.6										Prone 2
		DC	10	10	10	10	10										
		BSHC															Collapse Radius 4
		BSCC	36	9	2	1	0										
		BC	5K	747	172	82	32	19	13	8	5	4	2	1	1		
Burst in a Flooded Rice Paddy	0 - 6	PEN	2.7	2.6	2.6	2.5	2.4										Standing 5
		DC	4	4	3	3	3										Kneel/Fire Over 3
	7 - 8	PEN	3.2	3.2	3.1	3.0	3.0										Hands & Knees 2
		DC	8	8	8	8	8										Crawl 1
	9	PEN	3.4	3.3	3.3	3.2	3.2										Prone 1
		DC	10	9	9	9	9										
		BSHC															Collapse Radius 3
		BSCC	36	9	2	1	0										
		BC	5K	750	171	48	24	15	10	6	4	3	2	1	1		

ARTILLERY BURST DATA TABLE

3 105mm HE USA

			Burst Data: Range from Burst in 2 yard hexes													
			0	1	2	3	4	5	6	8	10	12	15	20	30	40
Airburst	0 - 6	PEN	21	20	20	20	19	19	18	17	16	15	14	12	8.8	6.5
		DC	8	8	8	8	8	8	7	7	7	7	7	6	5	4
	7 - 8	PEN	16	16	16	16	16	15	15	14	14	13	12	11	8.7	6.9
		DC	8	8	8	8	8	8	8	8	8	8	8	7	7	6
	9	PEN	14	14	14	14	14	14	13	13	12	12	11	10	8.3	6.7
		DC	9	9	9	9	8	8	8	8	8	8	8	8	7	7
		BSHC	23	21	17	13	9	7	5	3	2	2	1	-2	-5	-7
		BC	83	78	64	50	39	31	25	17	12	9	7	4	2	1
	0 - 1	ID	5	5	5	4	4	4	3	3	2	1	1			
	2 - 7	ID	8	8	7	7	6	6	5	4	3	3	2	1		
	8 - 9	ID	11	11	10	10	9	8	7	6	5	4	3	2	1	
		BSCC	2	2	2	1	1	-1	-2	-4	-5	-6	-8	-10	-13	
Burst on Earth	0 - 6	PEN	14	13	13	13	12	12	11	11	9.8	9.1	8.2	6.9	4.8	3.4
		DC	7	7	7	6	6	6	6	6	6	6	5	4	3	3
	7 - 8	PEN	12	12	12	12	11	11	11	10	9.7	9.2	8.6	7.5	5.8	4.5
		DC	8	8	7	7	7	7	7	7	7	7	7	6	6	5
	9	PEN	12	11	11	11	11	11	10	9.8	9.4	9.0	8.4	7.5	6.0	4.9
		DC	8	8	8	8	8	8	8	8	8	8	7	7	7	7
		BSHC	*4	*1	28	12	7	4	3	2	1	-1	-3	-5	-7	-10
		BSCC	*9	*2	58	26	13	9	6	4	2	2	1	-2	-5	-7
		BC	7K	998	204	62	45	24	17	10	7	5	4	2	1	1
	0 - 1	ID	6	6	5	5	5	4	4	4	3	3	2	2	1	1
	2 - 7	ID	11	11	10	10	9	9	8	8	7	6	5	4	2	2
	8 - 9	ID	20	19	19	18	17	16	16	14	13	12	11	8	5	4
		BSCC	33	8	2	1	-2	-4	-5	-7	-9	-10	-12	-14	-17	-19
Burst on Rock	0 - 6	PEN	23	22	21	21	20	20	19	18	17	16	14	12	8.9	6.5
		DC	8	8	8	8	8	8	8	7	7	7	7	6	5	4
	7 - 8	PEN	18	17	17	17	16	16	15	15	14	13	12	11	8.7	6.9
		DC	8	8	8	8	8	8	8	8	8	8	8	7	7	6
	9	PEN	15	15	15	15	14	14	14	13	13	12	11	10	8.3	6.8
		DC	9	9	9	9	9	9	8	8	8	8	8	8	7	7
		BSHC	*7	*2	46	20	12	7	5	3	2	1	-1	-3	-6	-8
		BSCC	*9	*2	56	25	14	9	6	3	2	2	1	-2	-5	-7
		BC	7K	932	173	78	47	32	23	14	10	7	5	3	2	1
	0 - 1	ID	4	4	4	3	3	3	3	2	2	2	1	1		
	2 - 7	ID	7	6	6	6	5	5	5	4	4	3	3	2	1	
	8 - 9	ID	10	10	9	9	8	8	7	7	6	5	4	3	2	1
		BSCC	32	8	2	1	-2	-4	-5	-7	-9	-10	-12	-14	-17	-19
Burst on Sand or Ice	0 - 6	PEN	5.8	5.7	5.5	5.2	5.0	4.8	4.6	4.2	3.9	3.6	3.2	2.6	1.7	1.1
		DC	4	4	4	4	4	3	3	3	3	3	3	2	1	1
	7 - 8	PEN	6.7	6.6	6.4	6.2	6.0	5.9	5.7	5.4	5.1	4.8	4.4	3.8	2.8	2.1
		DC	6	6	6	6	6	6	6	6	5	5	5	5	3	3
	9	PEN	6.9	6.8	6.6	6.4	6.3	6.1	6.0	5.7	5.4	5.2	4.8	4.2	3.3	2.6
		DC	7	7	7	7	7	7	7	7	8	8	7	7	6	5
		BSHC	*2	53	13	6	3	2	1	-1	-2	-4	-5	-7	-10	-12
		BSCC	*10	*2	61	27	15	10	7	4	2	2	1	-2	-5	-7
		BC	7K	1K	217	101	61	28	19	11	8	6	4	2	1	1
Burst in a Flooded Rice Paddy	0 - 6	PEN	4.5	4.4	4.2	4.0	3.8	3.6	3.5	3.2	2.9	2.7	2.3	1.9	1.2	.8
		DC	3	3	3	3	3	3	3	3	2	2	2	1	1	1
	7 - 8	PEN	5.4	5.3	5.2	5.0	4.9	4.7	4.6	4.3	4.1	3.8	3.5	3.0	2.2	1.6
		DC	6	5	5	5	5	5	5	5	5	5	4	4	3	2
	9	PEN	5.7	5.6	5.5	5.4	5.2	5.1	5.0	4.7	4.5	4.3	3.9	3.5	2.7	2.1
		DC	8	8	8	8	8	8	8	7	7	7	7	6	5	4
		BSHC	*1	32	8	4	2	1	1	-3	-4	-5	-7	-9	-12	-14
		BSCC	*10	*2	61	27	15	10	7	4	2	2	1	-2	-5	-7
		BC	7K	1K	217	101	39	24	17	10	7	5	3	2	1	1

Penetration and Critical Range

PEN	32
PENF	15
BC Contact	251K
Collapse Radius	1
Collapse Radius	0
Collapse Radius	4
Collapse Radius	4

Standing	3
Kneel/Fire Over	2
Hands & Knees	1
Crawl	1
Prone	1

Standing	2
Kneel/Fire Over	1
Hands & Knees	1
Crawl	1
Prone	0

Standing	7
Kneel/Fire Over	4
Hands & Knees	3
Crawl	2
Prone	2

Standing	6
Kneel/Fire Over	4
Hands & Knees	3
Crawl	2
Prone	2

ARTILLERY BURST DATA TABLE

4 **105mm HE**
USA delay fuse

			Burst Data	Range from Burst in 2 yard hexes													Penetration and Critical Range	
			0	1	2	3	4	5	6	8	10	12	15	20	30	40		
Airburst	0 - 6	PEN	21	20	20	20	19	19	18	17	16	15	14	12	8.8	6.5	PEN	32
		DC	8	8	8	8	8	8	7	7	7	7	7	6	5	4	PENF	15
	7 - 8	PEN	16	16	16	16	16	15	15	14	14	13	12	11	8.7	6.9		
		DC	8	8	8	8	8	8	8	8	8	8	8	7	7	6	BC Contact	251K
	9	PEN	14	14	14	14	14	14	13	13	12	12	11	10	8.3	6.7		
		DC	9	9	9	9	8	8	8	8	8	8	8	8	7	7		
		BSHC	23	21	17	13	9	7	5	3	2	2	1	-2	-5	-7		
		BC	83	78	64	50	39	31	25	17	12	9	7	4	2	1		
	0 - 1	ID	5	5	5	4	4	4	3	3	2	1	1					
	2 - 7	ID	7	8	7	7	6	6	5	4	3	3	2	1				
	8 - 9	ID	11	11	10	10	9	8	7	6	5	4	3	2	1			
		BSCC	2	2	2	1	1	-1	-2	-4	-5	-6	-8	-10	-13			
Burst on Earth	0 - 6	PEN	1.2	1.2	1.1	1.0	1.0	.9									Standing	3
		DC	1	1	1	1	1	1									Kneel/Fire Over	2
	7 - 8	PEN	1.8	1.8	1.7	1.6	1.6	1.5									Hands & Knees	1
		DC	2	2	2	2	2	2									Crawl	1
	9	PEN	2.1	2.1	2.0	2.0	1.9	1.8									Prone	1
		DC	4	4	3	3	3	3										
		BSHC															Collapse Radius	3
		BSCC	2	2	2	1	1	0										
		BC	7K	1K	92	29	14	9	6	3	2	1	1	1				
	0 - 1	ID	3	3	3	2	2	2	2	2	1	1	1	1				
	2 - 7	ID	6	6	5	5	5	4	4	4	3	3	2	2	1			
	8 - 9	ID	10	10	9	9	9	8	8	7	6	6	5	4	2	1		
		BSCC	*3	67	17	7	4	3	2	1	-2	-3	-4	-6	-9	-11		
Burst on Rock	0 - 6	PEN	23	22	21	21	20	20	19	18	17	16	14	12	8.9	6.5	Standing	2
		DC	8	8	8	8	8	8	8	7	7	7	7	6	5	4	Kneel/Fire Over	1
	7 - 8	PEN	18	17	17	17	16	16	15	15	14	13	12	11	8.7	6.9	Hands & Knees	1
		DC	8	8	8	8	8	8	8	8	8	8	8	7	7	6	Crawl	0
	9	PEN	15	15	15	15	14	14	14	13	13	12	11	10	8.3	6.8	Prone	0
		DC	9	9	9	9	9	9	8	8	8	8	8	8	7	7		
		BSHC	*7	*2	43	19	11	7	5	3	2	1	-1	-3	-6	-8	Collapse Radius	0
		BSCC	*9	*2	55	24	14	9	6	3	2	2	1	-2	-5	-7		
		BC	7K	885	162	74	44	30	22	13	9	7	5	3	2	1		
	0 - 1	ID	5	5	4	4	4	3	3	3	2	2	2	1				
	2 - 7	ID	8	8	7	7	6	6	5	5	4	4	3	2	1			
	8 - 9	ID	12	12	11	10	10	9	9	8	7	6	5	4	2	1		
		BSCC	39	10	2	1	-2	-3	-5	-7	-8	-10	-11	-13	-16	-18		
Burst on Sand or Ice	0 - 6	PEN	.4														Standing	3
		DC	1														Kneel/Fire Over	2
	7 - 8	PEN	.7	.7	.7	.6	.6										Hands & Knees	2
		DC	1	1	1	1	1										Crawl	1
	9	PEN	.9	.9	.8	.8	.8										Prone	1
		DC	1	1	1	1	1											
		BSHC															Collapse Radius	5
		BSCC	39	10	2	1	0											
		BC	8K	1K	206	29	14	8	6	3	2	1	1	1				
Burst in a Flooded Rice Paddy	0 - 6	PEN															Standing	2
		DC															Kneel/Fire Over	2
	7 - 8	PEN	.5	.5	.5	.4	.4										Hands & Knees	1
		DC	1	1	1	1	1										Crawl	1
	9	PEN	.6	.6	.6	.6	.5										Prone	1
		DC	1	1	1	1	1											
		BSHC															Collapse Radius	4
		BSCC	39	10	2	1	0											
		BC	8K	1K	60	16	8	4	3	2	1	1						

ARTILLERY BURST DATA TABLE

5 105mm HEAT USA

			Burst Data	Range from Burst in 2 yard hexes												Penetration and Critical Range	
			0	1	2	3	4	5	6	8	10	12	15	20	30	40	
Airburst	0 - 6	PEN	15	15	15	15	14	14	14	13	12	11	10	8.5	6.1	4.3	PEN 416
		DC	7	7	7	7	7	7	7	6	6	6	6	5	4	3	PENF -
	7 - 8	PEN	12	12	12	12	11	11	11	11	9.9	9.3	8.7	7.6	5.9	4.6	
		DC	7	7	7	7	7	7	7	7	7	7	7	6	6	5	BC Contact 140K
	9	PEN	10	10	10	10	10	9.8	9.6	9.3	8.9	8.5	7.9	7.1	5.7	4.5	
		DC	8	8	8	8	8	8	8	8	7	7	7	7	6	6	
		BSHC	12	12	9	7	5	4	3	2	1	1	-2	-4	-7	-9	
		BC	63	60	50	39	30	24	19	13	10	7	5	3	2	1	
	0 - 1	ID	5	5	5	4	4	4	3	3	2	2	1				
	2 - 7	ID	8	8	7	7	6	6	5	4	3	3	2	1			
	8 - 9	ID	11	11	10	10	9	8	7	6	5	4	3	2	1		
		BSCC	2	2	2	1	1	-1	-2	-4	-5	-6	-8	-10	-13		
Burst on Earth	0 - 6	PEN	17	17	16	15	15	14	14	13	12	11	10	8.6	6.1	4.3	Standing -
		DC	7	7	7	7	7	7	7	6	6	6	6	5	4	3	Kneel/Fire Over -
	7 - 8	PEN	13	13	12	12	12	11	11	11	9.9	9.4	8.7	7.7	5.9	4.6	Hands & Knees -
		DC	8	7	7	7	7	7	7	7	7	7	7	6	6	5	Crawl -
	9	PEN	11	11	11	11	10	10	9.8	9.4	9.0	8.6	8.0	7.2	5.7	4.5	Prone -
		DC	8	8	8	8	8	8	8	8	7	7	7	7	6	6	
		BSHC	*6	*1	35	16	9	6	4	2	1	1	-2	-4	-7	-9	Collapse Radius 0
		BSCC	*6	*1	35	16	9	6	4	2	1	1	-2	-4	-7	-9	
		BC	4K	678	162	78	47	33	24	15	10	8	5	3	2	1	
	0 - 1	ID	5	5	5	4	4	4	4	3	3						
	2 - 7	ID	7	7	7	6	6	6	5	5	4						
	8 - 9	ID	10	9	9	9	8	8	7	7	6						
		BSCC	1	-4	-9	-12	-14	-16	-17	-19	-21						
Burst on Rock	0 - 6	PEN	17	17	16	15	15	14	14	13	12	11	10	8.6	6.1	4.3	Standing -
		DC	7	7	7	7	7	7	7	6	6	6	6	5	4	3	Kneel/Fire Over -
	7 - 8	PEN	13	13	12	12	12	11	11	11	9.9	9.4	8.7	7.7	5.9	4.6	Hands & Knees -
		DC	8	7	7	7	7	7	7	7	7	7	7	6	6	5	Crawl -
	9	PEN	11	11	11	11	10	10	9.8	9.4	9.0	8.6	8.0	7.2	5.7	4.5	Prone -
		DC	8	8	8	8	8	8	8	8	7	7	7	7	6	6	
		BSHC	*6	*1	35	16	9	6	4	2	1	1	-2	-4	-7	-9	Collapse Radius -
		BSCC	*6	*1	35	16	9	6	4	2	1	1	-2	-4	-7	-9	
		BC	4K	678	162	78	47	33	24	15	10	8	5	3	2	1	
	0 - 1	ID	2	2	2	2	2	2	2	1							
	2 - 7	ID	3	3	3	3	3	2	2	2							
	8 - 9	ID	5	5	4	4	4	3	3	3							
		BSCC	1	-5	-10	-13	-15	-16	-18	-20							
Burst on Sand or Ice	0 - 6	PEN	17	17	16	15	15	14	14	13	12	11	10	8.6	6.1	4.3	Standing -
		DC	7	7	7	7	7	7	7	6	6	6	6	5	4	3	Kneel/Fire Over -
	7 - 8	PEN	13	13	12	12	12	11	11	11	9.9	9.4	8.7	7.7	5.9	4.6	Hands & Knees -
		DC	8	7	7	7	7	7	7	7	7	7	7	6	6	5	Crawl -
	9	PEN	11	11	11	11	10	10	9.8	9.4	9.0	8.6	8.0	7.2	5.7	4.5	Prone -
		DC	8	8	8	8	8	8	8	8	7	7	7	7	6	6	
		BSHC	*6	*1	35	16	9	6	4	2	1	1	-2	-4	-7	-9	Collapse Radius 1
		BSCC	*6	*1	35	16	9	6	4	2	1	1	-2	-4	-7	-9	
		BC	4K	678	162	78	47	33	24	15	10	8	5	3	2	1	
Burst in a Flooded Rice Paddy	0 - 6	PEN	17	17	16	15	15	14	14	13	12	11	10	8.6	6.1	4.3	Standing -
		DC	7	7	7	7	7	7	7	6	6	6	6	5	4	3	Kneel/Fire Over -
	7 - 8	PEN	13	13	12	12	12	11	11	11	9.9	9.4	8.7	7.7	5.9	4.6	Hands & Knees -
		DC	8	7	7	7	7	7	7	7	7	7	7	6	6	5	Crawl -
	9	PEN	11	11	11	11	10	10	9.8	9.4	9.0	8.6	8.0	7.2	5.7	4.5	Prone -
		DC	8	8	8	8	8	8	8	8	7	7	7	7	6	6	
		BSHC	*6	*1	35	16	9	6	4	2	1	1	-2	-4	-7	-9	Collapse Radius 1
		BSCC	*6	*1	35	16	9	6	4	2	1	1	-2	-4	-7	-9	
		BC	4K	678	162	78	47	33	24	15	10	8	5	3	2		

ARTILLERY BURST DATA TABLE

6 122mm HE USSR

			Burst Data	Range from Burst in 2 yard hexes												Penetration and Critical Range	
			0	1	2	3	4	5	6	8	10	12	15	20	30	40	
Airburst	0 - 6	PEN	21	21	21	21	20	20	19	18	17	16	15	12	9.0	6.5	PEN 39
		DC	8	8	8	8	8	8	7	7	7	7	7	6	5	4	PENF 19
	7 - 8	PEN	24	24	24	23	23	23	22	21	20	20	18	16	13	10	
		DC	9	9	9	9	9	9	9	9	9	9	8	8	8	7	BC Contact 461K
	9	PEN	21	21	21	21	20	20	20	19	18	18	17	15	12	10	
		DC	9	9	9	9	9	9	9	9	9	9	9	9	8	8	
		BSHC	26	25	20	15	11	8	6	4	3	2	1	-1	-4	-6	
		BC	110	103	85	66	51	40	32	22	16	12	8	5	3	2	
	0 - 1	ID	5	5	5	4	4	4	3	2	2	1	1				
	2 - 7	ID	8	8	7	7	6	6	5	4	3	3	2	1			
	8 - 9	ID	11	11	10	10	9	8	7	6	5	4	3	2	1		
		BSCC	3	3	2	2	1	1	-1	-3	-4	-6	-7	-9	-12		
Burst on Earth	0 - 6	PEN	12	11	11	10	10	9.7	9.3	8.7	8.0	7.5	6.7	5.5	3.8	2.6	Standing 4
		DC	6	6	6	6	6	6	6	5	5	5	4	4	3	2	Kneel/Fire Over 2
	7 - 8	PEN	12	12	12	11	11	11	11	10	9.5	9.0	8.3	7.3	5.6	4.3	Hands & Knees 1
		DC	7	7	7	7	7	7	7	7	7	7	6	6	5	5	Crawl 1
	9	PEN	12	12	12	12	11	11	11	10	9.8	9.4	8.8	7.8	6.3	5.0	Prone 1
		DC	8	8	8	8	8	8	8	8	8	7	7	7	7	7	
		BSHC	*5	*1	28	13	7	5	3	2	1	-1	-2	-5	-7	-9	Collapse Radius 2
		BSCC	*11	*3	68	30	17	11	8	4	3	2	1	-1	-4	-6	
		BC	13K	2K	290	82	46	30	21	13	9	6	4	3	1	1	
	0 - 1	ID	5	5	4	4	4	4	3	3	3	2	2	1	1		
	2 - 7	ID	10	10	9	9	8	8	7	7	6	5	5	3	2	1	
	8 - 9	ID	17	17	16	16	15	14	14	12	11	10	9	7	5	3	
		BSCC	*1	25	6	3	2	1	-1	-3	-5	-6	-8	-10	-13	-15	
Burst on Rock	0 - 6	PEN	23	23	22	22	21	20	20	18	17	16	15	13	9.1	6.6	Standing 2
		DC	8	8	8	8	8	8	8	7	7	7	7	6	5	4	Kneel/Fire Over 1
	7 - 8	PEN	26	25	25	24	24	23	23	22	21	20	18	16	13	11	Hands & Knees 1
		DC	9	9	9	9	9	9	9	9	9	9	8	8	8	7	Crawl 1
	9	PEN	22	22	22	21	21	20	20	19	19	18	17	15	13	10	Prone 0
		DC	9	9	9	9	9	9	9	9	9	9	9	9	8	8	
		BSHC	*9	*2	53	24	13	9	6	3	2	1	1	-2	-5	-7	Collapse Radius 1
		BSCC	*10	*3	64	29	16	10	7	4	3	2	1	-2	-4	-7	
		BC	13K	1K	237	104	61	41	30	18	13	9	6	4	2	1	
	0 - 1	ID	4	4	4	3	3	3	3	2	2	2	1	1			
	2 - 7	ID	7	6	6	6	5	5	5	4	4	3	3	2	1		
	8 - 9	ID	10	10	9	9	8	8	8	7	6	5	5	3	2	1	
		BSCC	57	14	4	2	1	-2	-3	-5	-7	-8	-10	-12	-15	-17	
Burst on Sand or Ice	0 - 6	PEN	3.9	3.8	3.7	3.5	3.3	3.2	3.0	2.8	2.5	2.3	2.0	1.6	1.0	.6	Standing 7
		DC	3	3	3	3	3	3	2	2	2	2	2	1	1	1	Kneel/Fire Over 5
	7 - 8	PEN	5.3	5.2	5.0	4.9	4.7	4.6	4.4	4.2	3.9	3.7	3.3	2.8	2.1	1.5	Hands & Knees 3
		DC	5	5	5	5	5	5	5	4	4	4	4	3	3	2	Crawl 2
	9	PEN	5.8	5.7	5.6	5.4	5.3	5.2	5.0	4.8	4.5	4.3	4.0	3.5	2.7	2.1	Prone 2
		DC	6	6	6	6	6	6	6	6	6	6	6	6	5	3	
		BSHC	86	21	5	2	1	-1	-2	-4	-6	-7	-8	-10	-13	-15	Collapse Radius 6
		BSCC	*11	*3	71	31	18	11	8	4	3	2	1	-1	-4	-6	
		BC	12K	2K	302	135	80	33	23	13	9	6	4	3	1	1	
Burst in a Flooded Rice Paddy	0 - 6	PEN	2.7	2.7	2.5	2.4	2.3	2.2	2.1	1.9	1.7	1.5	1.3	1.0			Standing 5
		DC	2	2	2	2	2	2	2	1	1	1	1	1			Kneel/Fire Over 4
	7 - 8	PEN	3.9	3.8	3.7	3.6	3.4	3.3	3.2	3.0	2.8	2.6	2.4	2.0			Hands & Knees 2
		DC	4	4	4	4	4	4	4	3	3	3	3	2			Crawl 2
	9	PEN	4.4	4.3	4.2	4.1	4.0	3.9	3.8	3.6	3.4	3.2	2.9	2.6			Prone 2
		DC	7	7	7	6	6	6	6	6	6	5	5	4			
		BSHC															Collapse Radius 6
		BSCC	*11	*3	71	31	18	11	8	4	3	2	1	0			
		BC	12K	2K	301	134	39	24	16	9	6	4	3	2	1	1	

ARTILLERY BURST DATA TABLE

7 **122mm HEAT USSR**

			Burst Data	Range from Burst in 2 yard hexes												Penetration and Critical Range
			0	1	2	3	4	5	6	8	10	12	15	20	30	40	
Airburst	0 - 6	PEN	11	11	11	10	10	10	10	9.7	9.4	9.1	8.6	7.9	6.6	5.6	PEN 13H
		DC	9	9	9	9	9	9	9	9	9	9	9	9	9	9	PENF -
	7 - 8	PEN	8.1	8.1	8.1	8.0	7.9	7.8	7.8	7.6	7.4	7.2	6.9	6.5	5.7	5.0	
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	BC Contact 203K
	9	PEN	7.1	7.1	7.1	7.1	7.0	6.9	6.9	6.7	6.6	6.4	6.2	5.9	5.2	4.7	
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
		BSHC	2	2	1	1	-1	-2	-3	-5	-6	-7	-9	-11	-14	-16	
		BC	75	71	58	46	36	28	23	15	11	8	6	4	2	1	
	0 - 1	ID	5	5	5	4	4	4	3	3	2	1	1				
	2 - 7	ID	8	8	7	7	6	6	5	4	3	3	2	1			
	8 - 9	ID	11	11	10	10	9	8	7	6	5	4	3	2	1		
		BSCC	3	3	2	2	1	1	-1	-3	-5	-6	-7	-9	-12		
Burst on Earth	0 - 6	PEN	11	11	11	11	11	10	10	9.8	9.5	9.1	8.7	7.9	6.7	5.6	Standing -
		DC	9	9	9	9	9	9	9	9	9	9	9	9	9	9	Kneel/Fire Over -
	7 - 8	PEN	8.4	8.4	8.3	8.2	8.1	8.0	7.8	7.6	7.4	7.2	7.0	6.5	5.7	5.0	Hands & Knees -
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	Crawl -
	9	PEN	7.4	7.3	7.3	7.2	7.1	7.0	6.9	6.8	6.6	6.5	6.2	5.9	5.2	4.7	Prone -
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
		BSHC	77	19	5	2	1	-1	-2	-4	-6	-7	-9	-11	-14	-16	Collapse Radius 1
		BSCC	77	19	5	2	1	-1	-2	-4	-6	-7	-9	-11	-14	-16	
		BC	6K	864	195	92	56	38	28	17	12	9	6	4	2	1	
	0 - 1	ID	5	5	5	4	4	4	4	3	3	2					
	2 - 7	ID	7	7	7	6	6	5	5	5	4	4					
	8 - 9	ID	10	9	9	8	8	8	7	6	6	5					
		BSCC	2	-3	-8	-11	-13	-15	-16	-18	-19	-21					
Burst on Rock	0 - 6	PEN	11	11	11	11	11	10	10	9.8	9.5	9.1	8.7	7.9	6.7	5.6	Standing -
		DC	9	9	9	9	9	9	9	9	9	9	9	9	9	9	Kneel/Fire Over -
	7 - 8	PEN	8.4	8.4	8.3	8.2	8.1	8.0	7.8	7.6	7.4	7.2	7.0	6.5	5.7	5.0	Hands & Knees -
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	Crawl -
	9	PEN	7.4	7.3	7.3	7.2	7.1	7.0	6.9	6.8	6.6	6.5	6.2	5.9	5.2	4.7	Prone -
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
		BSHC	77	19	5	2	1	-1	-2	-4	-6	-7	-9	-11	-14	-16	Collapse Radius 0
		BSCC	77	19	5	2	1	-1	-2	-4	-6	-7	-9	-11	-14	-16	
		BC	6K	864	195	92	56	38	28	17	12	9	6	4	2	1	
	0 - 1	ID	2	2	2	2	1	1	1	1	1						
	2 - 7	ID	3	3	2	2	2	2	2	1	1						
	8 - 9	ID	4	4	3	3	3	3	2	2	2						
		BSCC	1	-4	-9	-12	-14	-15	-17	-19	-20						
Burst on Sand or Ice	0 - 6	PEN	11	11	11	11	11	10	10	9.8	9.5	9.1	8.7	7.9	6.7	5.6	Standing -
		DC	9	9	9	9	9	9	9	9	9	9	9	9	9	9	Kneel/Fire Over -
	7 - 8	PEN	8.4	8.4	8.3	8.2	8.1	8.0	7.8	7.6	7.4	7.2	7.0	6.5	5.7	5.0	Hands & Knees -
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	Crawl -
	9	PEN	7.4	7.3	7.3	7.2	7.1	7.0	6.9	6.8	6.6	6.5	6.2	5.9	5.2	4.7	Prone -
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
		BSHC	77	19	5	2	1	-1	-2	-4	-6	-7	-9	-11	-14	-16	Collapse Radius 1
		BSCC	77	19	5	2	1	-1	-2	-4	-6	-7	-9	-11	-14	-16	
		BC	6K	864	195	92	56	38	28	17	12	9	6	4	2	1	
Burst in a Flooded Rice Paddy	0 - 6	PEN	11	11	11	11	11	10	10	9.8	9.5	9.1	8.7	7.9	6.7	5.6	Standing -
		DC	9	9	9	9	9	9	9	9	9	9	9	9	9	9	Kneel/Fire Over -
	7 - 8	PEN	8.4	8.4	8.3	8.2	8.1	8.0	7.8	7.6	7.4	7.2	7.0	6.5	5.7	5.0	Hands & Knees -
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	Crawl -
	9	PEN	7.4	7.3	7.3	7.2	7.1	7.0	6.9	6.8	6.6	6.5	6.2	5.9	5.2	4.7	Prone -
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
		BSHC	77	19	5	2	1	-1	-2	-4	-6	-7	-9	-11	-14	-16	Collapse Radius 1
		BSCC	77	19	5	2	1	-1	-2	-4	-6	-7	-9	-11	-14	-16	
		BC	6K	864	195	92	56	38	28	17	12	9	6	4	2	1	

8 130mm HE USSR

			Burst Data	Range from Burst in 2 yard hexes												Penetration and Critical Range	
			0	1	2	3	4	5	6	8	10	12	15	20	30	40	
Airburst	0 - 6	PEN	21	21	21	21	21	20	20	19	19	18	17	16	14	12	PEN 66
		DC	10	10	10	10	10	10	10	10	10	10	10	10	9	9	PENF 35
	7 - 8	PEN	16	16	16	16	16	16	16	15	15	14	14	13	12	10	
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	BC Contact 603K
	9	PEN	14	14	14	14	14	14	14	13	13	13	13	12	11	9.5	
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
		BSHC	3	3	3	2	1	1	-1	-2	-4	-5	-7	-8	-11	-13	
		BC	125	118	96	75	57	45	36	24	17	13	9	6	3	2	
	0 - 1	ID	5	5	5	4	4	4	3	2	2	1	1				
	2 - 7	ID	8	8	7	7	6	6	5	4	3	3	2	1			
	8 - 9	ID	11	11	10	10	9	8	7	6	5	4	3	2	1		
		BSCC	3	3	2	2	1	1	-1	-3	-4	-5	-7	-9	-12		
Burst on Earth	0 - 6	PEN	9.7	9.6	9.4	9.2	9.1	8.9	8.7	8.4	8.1	7.8	7.3	6.6	5.5	4.5	Standing 4
		DC	9	9	9	9	8	8	8	8	8	8	8	8	8	8	Kneel/Fire Over 3
	7 - 8	PEN	9.6	9.5	9.4	9.3	9.2	9.0	8.9	8.7	8.4	8.2	7.9	7.3	6.4	5.6	Hands & Knees 2
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	Crawl 1
	9	PEN	9.3	9.2	9.1	9.0	8.9	8.8	8.7	8.5	8.3	8.1	7.8	7.4	6.5	5.8	Prone 1
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
		BSHC	45	11	3	1	-1	-3	-4	-6	-8	-9	-11	-13	-16	-18	Collapse Radius 4
		BSCC	*1	35	9	4	2	1	1	-2	-4	-5	-7	-9	-12	-14	
		BC	16K	2K	344	92	50	32	23	13	9	7	5	3	1	1	
	0 - 1	ID	4	4	4	3	3	3	3	2	2	2	1	1			
	2 - 7	ID	8	8	7	7	7	6	6	5	5	4	4	3	2	1	
	8 - 9	ID	14	14	13	13	12	12	11	10	9	8	7	6	4	2	
		BSCC	*2	59	15	7	4	2	2	1	-2	-3	-5	-7	-10	-12	
Burst on Rock	0 - 6	PEN	22	22	22	21	21	21	20	20	19	18	18	16	14	12	Standing 2
		DC	10	10	10	10	10	10	10	10	10	10	10	10	9	9	Kneel/Fire Over 1
	7 - 8	PEN	17	17	16	16	16	16	16	15	15	15	14	13	12	10	Hands & Knees 1
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	Crawl 1
	9	PEN	15	15	14	14	14	14	14	14	13	13	13	12	11	9.5	Prone 0
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
		BSHC	*1	25	6	3	2	1	-1	-3	-5	-6	-8	-10	-13	-15	Collapse Radius 1
		BSCC	*1	33	8	4	2	1	1	-2	-4	-5	-7	-9	-12	-14	
		BC	16K	2K	258	110	64	43	31	19	13	10	7	4	2	1	
	0 - 1	ID	3	3	3	2	2	2	2	2	1	1	1				
	2 - 7	ID	5	5	5	4	4	4	4	3	3	2	2	1			
	8 - 9	ID	8	8	7	7	7	6	6	5	5	4	3	3	1	1	
		BSCC	*1	32	8	4	2	1	1	-3	-4	-5	-7	-9	-12	-14	
Burst on Sand or Ice	0 - 6	PEN	5.5	5.4	5.3	5.2	5.1	5.0	4.9	4.7							Standing 6
		DC	10	10	10	10	10	9	9	9							Kneel/Fire Over 4
	7 - 8	PEN	6.3	6.3	6.2	6.1	6.0	5.9	5.8	5.6							Hands & Knees 3
		DC	10	10	10	10	10	10	10	10							Crawl 2
	9	PEN	6.5	6.4	6.4	6.3	6.2	6.1	6.0	5.9							Prone 2
		DC	10	10	10	10	10	10	10	10							
		BSHC															Collapse Radius 8
		BSCC	*1	32	8	4	2	1	1	0							
		BC	16K	2K	352	154	90	32	21	12	8	6	4	2	1	1	
Burst in a Flooded Rice Paddy	0 - 6	PEN	4.4	4.3	4.2	4.2	4.1	4.0	3.9	3.7							Standing 5
		DC	9	9	9	9	9	9	9	8							Kneel/Fire Over 3
	7 - 8	PEN	5.3	5.3	5.2	5.1	5.0	4.9	4.9	4.7							Hands & Knees 2
		DC	10	10	10	10	10	10	10	10							Crawl 2
	9	PEN	5.6	5.5	5.5	5.4	5.3	5.2	5.2	5.0							Prone 2
		DC	10	10	10	10	10	10	10	10							
		BSHC															Collapse Radius 7
		BSCC	*1	32	8	4	2	1	1	0							
		BC	16K	2K	349	152	39	23	16	9	6	4	3	2	1	1	

ARTILLERY BURST DATA TABLE

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Burst Data — Range from Burst in 2 yard hexes

			0	1	2	3	4	5	6	8	10	12	15	20	30	40
Airburst	0 - 6	PEN	24	24	24	24	23	23	22	21	20	18	17	14	11	7.8
		DC	8	8	8	8	8	8	8	8	8	7	7	7	6	5
	7 - 8	PEN	36	36	36	36	35	34	34	33	31	30	28	26	21	17
		DC	10	10	10	10	10	10	10	10	10	10	9	9	9	8
	9	PEN	32	32	32	31	31	31	30	29	28	27	26	24	20	17
		DC	10	10	10	10	10	10	10	10	10	10	10	9	9	9
		BSHC	33	31	24	18	14	10	8	5	3	2	2	1	-3	-5
		BC	156	147	119	92	70	55	44	29	21	16	11	7	4	2
	0 - 1	ID	5	5	5	4	4	4	3	2	2	1	1			
	2 - 7	ID	8	8	7	7	6	6	5	4	3	3	2	1		
	8 - 9	ID	11	11	10	10	9	8	7	6	5	4	3	2	1	
		BSCC	4	4	3	2	2	1	1	-2	-3	-5	-6	-8	-11	
Burst on Earth	0 - 6	PEN	27	26	26	25	24	23	23	21	20	19	17	15	11	7.8
		DC	8	8	8	8	8	8	8	8	8	7	7	7	6	5
	7 - 8	PEN	39	38	37	37	36	35	34	33	32	30	29	26	21	17
		DC	10	10	10	10	10	10	10	10	10	10	9	9	9	8
	9	PEN	34	34	33	32	32	31	31	30	29	27	26	24	20	17
		DC	10	10	10	10	10	10	10	10	10	10	10	9	9	9
		BSHC	*8	*2	48	21	12	8	5	3	2	1	-1	-3	-6	-8
		BSCC	*14	*3	85	38	21	14	9	5	3	2	2	-1	-3	-6
		BC	25K	3K	440	134	74	48	35	21	14	10	7	4	2	1
	0 - 1	ID	7	6	6	6	5	5	5	4	4	3	3	2	1	1
	2 - 7	ID	13	13	12	12	11	11	10	9	8	7	6	5	3	2
	8 - 9	ID	23	23	22	21	20	19	19	17	16	15	13	10	7	5
		BSCC	*1	33	8	4	2	1	1	-2	-4	-5	-7	-9	-12	-14
Burst on Rock	0 - 6	PEN	27	26	26	25	24	23	23	21	20	19	17	15	11	7.8
		DC	8	8	8	8	8	8	8	8	8	7	7	7	6	5
	7 - 8	PEN	39	38	37	37	36	35	34	33	32	30	29	26	21	17
		DC	10	10	10	10	10	10	10	10	10	10	9	9	9	8
	9	PEN	34	34	33	32	32	31	31	30	29	27	26	24	20	17
		DC	10	10	10	10	10	10	10	10	10	10	10	9	9	9
		BSHC	*11	*3	71	32	18	11	8	4	3	2	1	-1	-4	-6
		BSCC	*13	*3	82	37	21	13	9	5	3	2	1	-1	-4	-6
		BC	25K	3K	382	159	91	60	44	27	18	14	9	6	3	2
	0 - 1	ID	2	2	2	2	2	2	2	1	1	1	1			
	2 - 7	ID	4	4	4	4	3	3	3	3	2	2	2	1		
	8 - 9	ID	7	7	7	6	6	5	5	4	4	3	3	2	1	1
		BSCC	*1	26	7	3	2	1	-1	-3	-5	-6	-8	-10	-13	-15
Burst on Sand or Ice	0 - 6	PEN	9.8	9.6	9.3	8.9	8.6	8.3	7.9	7.4	6.8	6.3	5.6	4.6	3.1	2.1
		DC	6	6	6	5	5	5	5	5	4	4	4	3	3	2
	7 - 8	PEN	12	12	12	11	11	11	10	9.8	9.3	8.8	8.1	7.1	5.5	4.2
		DC	7	7	7	7	7	7	7	7	7	7	6	6	5	4
	9	PEN	13	13	12	12	12	11	11	11	10	9.8	9.1	8.2	6.5	5.2
		DC	8	8	8	8	8	8	8	8	8	8	7	7	7	6
		BSHC	*4	*1	28	12	7	4	3	2	1	-1	-2	-5	-7	-10
		BSCC	*14	*4	89	40	22	14	10	6	4	2	2	1	-3	-5
		BC	24K	3K	463	196	113	75	39	23	15	11	7	5	2	1
Burst in a Flooded Rice Paddy	0 - 6	PEN	6.5	6.4	6.1	5.8	5.6	5.4	5.1	4.7	4.3	4.0	3.5	2.8	1.9	1.2
		DC	4	4	4	4	4	4	4	3	3	3	3	2	1	1
	7 - 8	PEN	8.6	8.4	8.2	8.0	7.7	7.5	7.3	6.9	6.5	6.2	5.7	4.9	3.7	2.8
		DC	7	6	6	6	6	6	6	6	6	6	6	5	4	3
	9	PEN	9.4	9.3	9.1	8.8	8.6	8.4	8.2	7.9	7.5	7.1	6.7	5.9	4.7	3.7
		DC	7	7	7	7	7	7	7	7	7	7	7	6	6	6
		BSHC	*3	83	21	9	5	3	2	1	-1	-2	-4	-6	-9	-11
		BSCC	*14	*4	88	39	22	14	10	6	4	2	2	1	-3	-5
		BC	24K	3K	462	195	112	47	32	19	12	9	6	4	2	1

Penetration and Critical Range

PEN	65
PENF	34
BC Contact	957K

Standing	4
Kneel/Fire Over	2
Hands & Knees	1
Crawl	1
Prone	1
Collapse Radius	3

Standing	2
Kneel/Fire Over	1
Hands & Knees	1
Crawl	1
Prone	0
Collapse Radius	1

Standing	8
Kneel/Fire Over	5
Hands & Knees	3
Crawl	3
Prone	2
Collapse Radius	9

Standing	6
Kneel/Fire Over	4
Hands & Knees	3
Crawl	2
Prone	2
Collapse Radius	8

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			Burst Data	Range from Burst in 2 yard hexes												Penetration and Critical Range	
			0	1	2	3	4	5	6	8	10	12	15	20	30	40	
Airburst	0 - 6	PEN	26	26	26	25	25	24	23	22	21	20	18	15	11	8.3	PEN 68
		DC	8	8	8	8	8	8	8	8	8	7	7	7	6	5	PENF 34
	7 - 8	PEN	51	51	50	50	49	48	47	46	44	42	40	37	30	25	
		DC	10	10	10	10	10	10	10	10	10	10	10	10	9	9	BC Contact 1668K
	9	PEN	45	45	44	44	43	43	42	41	40	38	36	34	28	24	
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	9	
		BSHC	33	31	25	19	14	10	8	5	3	2	2	1	-3	-5	
		BC	208	195	157	120	91	70	56	37	27	20	14	9	5	3	
	0 - 1	ID	5	5	5	4	4	4	3	2	2	1	1				
	2 - 7	ID	8	8	7	7	6	6	5	4	3	3	2	1			
	8 - 9	ID	11	11	10	10	9	8	7	6	5	4	3	2	1		
		BSCC	4	4	3	2	2	1	1	-2	-3	-5	-6	-8	-11		
Burst on Earth	0 - 6	PEN	29	28	27	26	26	25	24	23	21	20	18	16	11	8.3	Standing 4
		DC	8	8	8	8	8	8	8	8	8	8	7	7	6	5	Kneel/Fire Over 3
	7 - 8	PEN	44	44	43	42	41	40	39	38	36	35	33	30	24	20	Hands & Knees 2
		DC	10	10	10	10	10	10	10	10	10	10	10	9	9	9	Crawl 1
	9	PEN	40	40	39	38	38	37	36	35	34	33	31	28	24	20	Prone 1
		DC	10	10	10	10	10	10	10	10	10	10	10	10	9	9	
		BSHC	*7	*2	45	20	11	7	5	3	2	1	-1	-3	-6	-8	Collapse Radius 5
		BSCC	*14	*3	87	39	22	14	10	5	3	2	2	1	-3	-5	
		BC	41K	4K	643	188	100	64	45	27	18	13	9	6	3	2	
	0 - 1	ID	7	7	6	6	6	5	5	4	4	3	3	2	1	1	
	2 - 7	ID	14	13	13	12	12	11	11	10	9	8	7	5	3	2	
	8 - 9	ID	25	24	23	22	21	21	20	18	17	15	14	11	7	5	
		BSCC	*2	62	16	7	4	3	2	1	-2	-3	-5	-7	-10	-12	
Burst on Rock	0 - 6	PEN	29	28	27	26	26	25	24	23	21	20	18	16	11	8.3	Standing 3
		DC	8	8	8	8	8	8	8	8	8	8	7	7	6	5	Kneel/Fire Over 2
	7 - 8	PEN	54	53	52	51	50	49	48	46	45	43	40	37	30	25	Hands & Knees 1
		DC	10	10	10	10	10	10	10	10	10	10	10	10	9	9	Crawl 1
	9	PEN	47	47	46	45	44	43	43	41	40	39	37	34	28	24	Prone 1
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	9	
		BSHC	*11	*3	69	31	17	11	8	4	3	2	1	-1	-4	-6	Collapse Radius 2
		BSCC	*13	*3	84	37	21	13	9	5	3	2	1	-1	-4	-6	
		BC	42K	4K	540	212	118	77	55	33	23	17	12	7	4	2	
	0 - 1	ID	3	3	2	2	2	2	2	2	1	1	1				
	2 - 7	ID	5	5	5	4	4	4	3	3	3	2	2	1			
	8 - 9	ID	8	8	8	7	7	6	6	5	5	4	4	3	1	1	
		BSCC	*2	41	10	5	3	2	1	-2	-3	-5	-6	-8	-11	-13	
Burst on Sand or Ice	0 - 6	PEN	9.8	9.6	9.2	8.9	8.5	8.2	7.9	7.3	6.7	6.2	5.5	4.5	3.1	2.1	Standing 9
		DC	6	6	5	5	5	5	5	5	4	4	4	3	2	2	Kneel/Fire Over 6
	7 - 8	PEN	13	13	12	12	12	11	11	10	9.9	9.4	8.6	7.6	5.8	4.5	Hands & Knees 4
		DC	7	7	7	7	7	7	7	7	7	7	6	6	5	5	Crawl 3
	9	PEN	14	14	13	13	13	13	12	12	11	11	10	9.0	7.2	5.8	Prone 3
		DC	8	8	8	8	8	8	8	8	8	8	8	7	7	6	
		BSHC	*4	91	23	10	6	4	3	1	1	-2	-3	-5	-8	-10	Collapse Radius 13
		BSCC	*14	*4	90	40	22	14	10	6	4	2	2	1	-3	-5	
		BC	40K	4K	657	264	148	98	51	29	19	14	9	6	3	2	
Burst in a Flooded Rice Paddy	0 - 6	PEN	6.7	6.6	6.3	6.0	5.8	5.5	5.3	4.9	4.5	4.1	3.6	2.9	1.9	1.2	Standing 7
		DC	4	4	4	4	4	4	4	3	3	3	3	2	1	1	Kneel/Fire Over 5
	7 - 8	PEN	9.3	9.1	8.9	8.6	8.4	8.2	7.9	7.5	7.1	6.7	6.1	5.3	4.0	3.0	Hands & Knees 3
		DC	7	7	7	6	6	6	6	6	6	6	6	5	4	3	Crawl 3
	9	PEN	10	10	10	9.8	9.6	9.4	9.2	8.7	8.3	7.9	7.4	6.6	5.2	4.1	Prone 2
		DC	8	8	8	8	7	7	7	7	7	7	7	7	6	6	
		BSHC	*2	60	15	7	4	2	2	1	-2	-3	-5	-7	-10	-12	Collapse Radius 12
		BSCC	*14	*4	89	40	22	14	10	6	4	2	2	1	-3	-5	
		BC	40K	4K	657	263	148	61	42	24	16	11	8	5	2	1	

ARTILLERY BURST DATA TABLE

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			Burst Data	Range from Burst in 2 yard hexes												Penetration and Critical Range
			0	1	2	3	4	5	6	8	10	12	15	20	30	40	
Airburst	0 - 6	PEN	25	25	24	24	23	23	22	21	20	19	17	15	11	8.5	PEN 17H
		DC	8	8	8	8	8	8	8	8	8	8	7	7	6	6	PENF
	7 - 8	PEN	21	21	21	21	21	20	20	19	18	18	17	15	12	9.7	
		DC	9	9	9	9	9	9	9	9	9	9	8	8	8	7	BC Contact 421K
	9	PEN	19	19	19	18	18	18	18	17	16	16	15	14	11	9.5	
		DC	9	9	9	9	9	9	9	9	9	9	9	9	8	8	
		BSHC	26	24	19	14	10	8	6	3	2	1	1	-2	-5	-7	
		BC	105	99	81	63	49	38	31	21	15	11	8	5	3	2	
	0 - 1	ID	5	5	4	4	3	3	3	2	1	1					
	2 - 7	ID	7	7	7	6	6	5	5	4	3	2	1				
	8 - 9	ID	10	10	10	9	8	8	7	6	4	3	2	1			
		BSCC	3	3	2	2	1	1	0	-3	-4	-5	-7	-9			
Burst on Earth	0 - 6	PEN	27	26	26	25	24	24	23	22	20	19	18	15	11	8.5	Standing -
		DC	9	8	8	8	8	8	8	8	8	8	7	7	6	6	Kneel/Fire Over -
	7 - 8	PEN	23	22	22	22	21	21	20	19	19	18	17	15	12	9.8	Hands & Knees -
		DC	9	9	9	9	9	9	9	9	9	9	8	8	8	7	Crawl -
	9	PEN	20	20	19	19	19	18	18	17	17	16	15	14	11	9.5	Prone -
		DC	9	9	9	9	9	9	9	9	9	9	9	9	8	8	
		BSHC	*12	*3	74	32	18	11	8	4	2	2	1	-2	-4	-7	Collapse Radius 1
		BSCC	*12	*3	74	32	18	11	8	4	2	2	1	-2	-4	-7	
		BC	11K	1K	287	130	77	52	38	24	16	12	8	5	3	2	
	0 - 1	ID															
	2 - 7	ID															
	8 - 9	ID															
		BSCC															
Burst on Rock	0 - 6	PEN	27	26	26	25	24	24	23	22	20	19	18	15	11	8.5	Standing -
		DC	9	8	8	8	8	8	8	8	8	8	7	7	6	6	Kneel/Fire Over -
	7 - 8	PEN	23	22	22	22	21	21	20	19	19	18	17	15	12	9.8	Hands & Knees -
		DC	9	9	9	9	9	9	9	9	9	9	8	8	8	7	Crawl -
	9	PEN	20	20	19	19	19	18	18	17	17	16	15	14	11	9.5	Prone -
		DC	9	9	9	9	9	9	9	9	9	9	9	9	8	8	
		BSHC	*12	*3	74	32	18	11	8	4	2	2	1	-2	-4	-7	Collapse Radius 0
		BSCC	*12	*3	74	32	18	11	8	4	2	2	1	-2	-4	-7	
		BC	11K	1K	287	130	77	52	38	24	16	12	8	5	3	2	
	0 - 1	ID															
	2 - 7	ID															
	8 - 9	ID															
		BSCC															
Burst on Sand or Ice	0 - 6	PEN	27	26	26	25	24	24	23	22	20	19	18	15	11	8.5	Standing -
		DC	9	8	8	8	8	8	8	8	8	8	7	7	6	6	Kneel/Fire Over -
	7 - 8	PEN	23	22	22	22	21	21	20	19	19	18	17	15	12	9.8	Hands & Knees -
		DC	9	9	9	9	9	9	9	9	9	9	8	8	8	7	Crawl -
	9	PEN	20	20	19	19	19	18	18	17	17	16	15	14	11	9.5	Prone -
		DC	9	9	9	9	9	9	9	9	9	9	9	9	8	8	
		BSHC	*12	*3	74	32	18	11	8	4	2	2	1	-2	-4	-7	Collapse Radius 2
		BSCC	*12	*3	74	32	18	11	8	4	2	2	1	-2	-4	-7	
		BC	11K	1K	287	130	77	52	38	24	16	12	8	5	3	2	
Burst in a Flooded Rice Paddy	0 - 6	PEN	27	26	26	25	24	24	23	22	20	19	18	15	11	8.5	Standing -
		DC	9	8	8	8	8	8	8	8	8	8	7	7	6	6	Kneel/Fire Over -
	7 - 8	PEN	23	22	22	22	21	21	20	19	19	18	17	15	12	9.8	Hands & Knees -
		DC	9	9	9	9	9	9	9	9	9	9	8	8	8	7	Crawl -
	9	PEN	20	20	19	19	19	18	18	17	17	16	15	14	11	9.5	Prone -
		DC	9	9	9	9	9	9	9	9	9	9	9	9	8	8	
		BSHC	*12	*3	74	32	18	11	8	4	2	2	1	-2	-4	-7	Collapse Radius 2
		BSCC	*12	*3	74	32	18	11	8	4	2	2	1	-2	-4	-7	
		BC	11K	1K	287	130	77	52	38	24	16	12	8	5	3	2	

12 155mm HE USA

			Burst Data: Range from Burst in 2 yard hexes													
			0	1	2	3	4	5	6	8	10	12	15	20	30	40
Airburst	0 - 6	PEN	26	26	25	25	24	24	23	22	21	19	18	15	11	8.3
		DC	8	8	8	8	8	8	8	8	8	8	7	7	6	5
	7 - 8	PEN	40	40	40	39	39	38	37	36	35	33	32	29	24	19
		DC	10	10	10	10	10	10	10	10	10	10	10	9	9	9
	9	PEN	35	35	35	35	34	34	33	32	31	30	29	26	22	19
		DC	10	10	10	10	10	10	10	10	10	10	10	10	9	9
		BSHC	33	31	25	18	14	10	8	5	3	2	2	1	-3	-5
		BC	171	161	130	100	76	59	47	32	23	17	12	8	4	3
	0 - 1	ID	5	5	5	4	4	4	3	2	2	1	1			
	2 - 7	ID	8	8	7	7	6	6	5	4	3	3	2	1		
	8 - 9	ID	11	11	10	10	9	8	7	6	5	4	3	2	1	
		BSCC	4	4	3	2	2	1	1	-2	-3	-5	-6	-8	-11	
Burst on Earth	0 - 6	PEN	28	28	27	26	25	24	24	22	21	20	18	15	11	8.3
		DC	8	8	8	8	8	8	8	8	8	8	7	7	6	5
	7 - 8	PEN	42	42	41	40	40	39	38	37	35	34	32	29	24	19
		DC	10	10	10	10	10	10	10	10	10	10	10	9	9	9
	9	PEN	37	37	36	36	35	34	34	33	32	30	29	26	22	19
		DC	10	10	10	10	10	10	10	10	10	10	10	10	9	9
		BSHC	*8	*2	48	21	12	8	5	3	2	1	-1	-3	-6	-8
		BSCC	*14	*3	86	38	21	14	10	5	3	2	2	-1	-3	-6
		BC	29K	3K	495	149	82	53	38	23	15	11	8	5	2	2
	0 - 1	ID	7	7	6	6	6	5	5	4	4	4	3	2	1	1
	2 - 7	ID	14	14	13	12	12	11	11	10	9	8	7	5	3	2
	8 - 9	ID	25	24	23	22	22	21	20	18	17	15	14	11	7	5
		BSCC	*2	38	9	4	2	2	1	-2	-4	-5	-6	-8	-11	-13
Burst on Rock	0 - 6	PEN	28	28	27	26	25	24	24	22	21	20	18	15	11	8.3
		DC	8	8	8	8	8	8	8	8	8	8	7	7	6	5
	7 - 8	PEN	42	42	41	40	40	39	38	37	35	34	32	29	24	19
		DC	10	10	10	10	10	10	10	10	10	10	8	9	9	9
	9	PEN	37	37	36	36	35	34	34	33	32	30	29	26	22	19
		DC	10	10	10	10	10	10	10	10	10	10	10	10	9	9
		BSHC	*11	*3	71	32	18	11	8	4	3	2	1	-1	-4	-6
		BSCC	*13	*3	83	37	21	13	9	5	3	2	1	-1	-4	-6
		BC	29K	3K	428	175	99	66	47	29	20	15	10	6	3	2
	0 - 1	ID	3	3	2	2	2	2	2	1	1	1	1			
	2 - 7	ID	5	4	4	4	4	3	3	3	2	2	2	1		
	8 - 9	ID	8	7	7	7	6	6	5	5	4	4	3	2	1	1
		BSCC	*1	30	7	3	2	1	-1	-3	-4	-6	-7	-9	-12	-14
Burst on Sand or Ice	0 - 6	PEN	11	11	10	9.8	9.4	9.1	8.8	8.1	7.5	7.0	6.2	5.2	3.5	2.4
		DC	6	6	6	6	6	5	5	5	5	4	4	4	3	2
	7 - 8	PEN	13	13	13	12	12	12	11	11	10	9.8	9.0	7.9	6.1	4.8
		DC	8	8	8	7	7	7	7	7	7	7	7	6	6	5
	9	PEN	14	14	13	13	13	13	12	12	11	11	10	9.1	7.3	5.9
		DC	8	8	8	8	8	8	8	8	8	8	8	7	7	6
		BSHC	*5	*1	28	13	7	5	3	2	1	-1	-2	-5	-7	-9
		BSCC	*14	*4	89	40	22	14	10	6	4	2	2	1	-3	-5
		BC	28K	3K	517	216	123	82	43	25	17	12	8	5	3	2
Burst in a Flooded Rice Paddy	0 - 6	PEN	7.1	7.0	6.7	6.4	6.2	5.9	5.7	5.2	4.8	4.4	3.9	3.2	2.1	1.4
		DC	5	4	4	4	4	4	4	4	3	3	3	3	2	1
	7 - 8	PEN	9.4	9.3	9.0	8.8	8.5	8.3	8.1	7.6	7.2	6.8	6.3	5.5	4.2	3.2
		DC	7	7	7	7	7	6	6	6	6	6	6	5	4	4
	9	PEN	10	10	10	9.7	9.5	9.3	9.1	8.7	8.3	7.9	7.4	6.6	5.2	4.2
		DC	8	8	8	8	8	7	7	7	7	7	7	7	7	7
		BSHC	*3	83	21	9	5	3	2	1	-1	-2	-4	-6	-9	-11
		BSCC	*14	*4	88	39	22	14	10	6	4	2	2	1	-3	-5
		BC	28K	3K	517	215	122	52	36	21	14	10	7	4	2	1

Penetration and Critical Range	
PEN	61
PENF	31
BC Contact	1147K
Standing	4
Kneel/Fire Over	2
Hands & Knees	2
Crawl	1
Prone	1
Collapse Radius	3
Standing	2
Kneel/Fire Over	2
Hands & Knees	1
Crawl	1
Prone	0
Collapse Radius	1
Standing	8
Kneel/Fire Over	5
Hands & Knees	4
Crawl	3
Prone	2
Collapse Radius	10
Standing	7
Kneel/Fire Over	4
Hands & Knees	3
Crawl	2
Prone	2
Collapse Radius	9

ARTILLERY BURST DATA TABLE

13 155mm HE USA new

Burst Data — Range from Burst in 2 yard hexes

			0	1	2	3	4	5	6	8	10	12	15	20	30	40
Airburst	0 - 6	PEN	24	24	24	23	23	22	21	20	19	18	16	14	9.8	7.1
		DC	8	8	8	8	8	8	8	7	7	7	7	6	6	4
	7 - 8	PEN	48	48	48	47	47	46	45	43	42	40	38	34	28	23
		DC	10	10	10	10	10	10	10	10	10	10	10	10	9	9
	9	PEN	47	47	47	46	46	45	44	43	41	40	38	35	29	25
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	9
		BSHC	34	31	25	19	14	11	8	5	3	2	2	1	-3	-5
		BC	212	199	159	122	92	71	56	38	27	21	14	9	5	3
	0 - 1	ID	5	5	5	4	4	4	3	2	2	1	1			
	2 - 7	ID	8	8	7	7	6	6	5	4	3	3	2	1		
	8 - 9	ID	11	11	10	10	9	8	7	6	5	4	3	2	1	
		BSCC	4	4	3	2	2	1	1	-2	-3	-4	-6	-8	-11	
Burst on Earth	0 - 6	PEN	26	26	25	24	24	23	22	21	19	18	16	14	9.9	7.1
		DC	8	8	8	8	8	8	8	8	7	7	7	6	6	4
	7 - 8	PEN	51	51	50	49	48	47	46	44	42	41	38	34	28	23
		DC	10	10	10	10	10	10	10	10	10	10	10	10	9	9
	9	PEN	49	49	48	47	47	46	45	43	42	40	38	35	29	25
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	9
		BSHC	*8	*2	49	22	12	8	5	3	2	1	1	-3	-5	-7
		BSCC	*14	*4	89	40	22	14	10	6	4	2	2	1	-3	-5
		BC	42K	4K	653	194	104	66	47	28	19	14	9	6	3	2
	0 - 1	ID	8	8	7	7	6	6	6	5	4	4	3	3	1	1
	2 - 7	ID	15	15	14	14	13	13	12	11	10	9	8	6	4	2
	8 - 9	ID	28	27	26	25	24	23	22	21	19	17	15	13	8	6
		BSCC	*2	50	13	6	3	2	1	-1	-3	-4	-5	-7	-10	-12
Burst on Rock	0 - 6	PEN	26	26	25	24	24	23	22	21	19	18	16	14	9.9	7.1
		DC	8	8	8	8	8	8	8	8	7	7	7	6	6	4
	7 - 8	PEN	51	51	50	49	48	47	46	44	42	41	38	34	28	23
		DC	10	10	10	10	10	10	10	10	10	10	10	10	9	9
	9	PEN	49	49	48	47	47	46	45	43	42	40	38	35	29	25
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	9
		BSHC	*12	*3	73	32	18	12	8	5	3	2	1	-1	-4	-6
		BSCC	*14	*3	86	38	21	14	10	5	3	2	2	-1	-3	-6
		BC	43K	4K	559	219	122	80	57	34	24	17	12	7	4	2
	0 - 1	ID	3	3	3	2	2	2	2	2	1	1	1			
	2 - 7	ID	5	5	5	4	4	4	4	3	3	2	2	1	1	
	8 - 9	ID	9	9	8	8	7	7	6	6	5	4	4	3	2	1
		BSCC	*1	36	9	4	2	1	1	-2	-4	-5	-7	-9	-12	-14
Burst on Sand or Ice	0 - 6	PEN	13	12	12	11	11	11	10	9.3	8.6	8.0	7.1	5.8	3.9	2.7
		DC	6	6	6	6	6	6	6	5	5	5	4	4	3	2
	7 - 8	PEN	16	15	15	15	14	14	14	13	12	12	11	9.3	7.2	5.5
		DC	8	8	8	8	8	7	7	7	7	7	7	7	6	5
	9	PEN	17	17	16	16	15	15	15	14	14	13	12	11	8.7	7.0
		DC	9	9	8	8	8	8	8	8	8	8	8	8	7	7
		BSHC	*5	*1	28	13	7	5	3	2	1	-1	-2	-4	-7	-9
		BSCC	*15	*4	92	41	23	15	10	6	4	3	2	1	-3	-5
		BC	41K	4K	671	269	151	99	71	31	21	15	10	6	3	2
Burst in a Flooded Rice Paddy	0 - 6	PEN	8.2	8.0	7.7	7.4	7.0	6.7	6.5	5.9	5.4	5.0	4.4	3.6	2.3	1.5
		DC	5	5	5	4	4	4	4	4	3	3	3	3	2	1
	7 - 8	PEN	11	11	11	10	10	9.7	9.5	8.9	8.4	8.0	7.3	6.3	4.8	3.6
		DC	7	7	7	7	7	7	7	6	6	6	6	6	4	4
	9	PEN	12	12	12	12	11	11	11	10	9.8	9.4	8.7	7.7	6.1	4.8
		DC	8	8	8	8	8	8	8	7	7	7	7	7	6	6
		BSHC	*3	84	21	9	5	3	2	1	-1	-2	-4	-6	-9	-11
		BSCC	*15	*4	91	41	23	15	10	6	4	3	2	1	-3	-5
		BC	41K	4K	671	268	150	67	46	26	17	12	8	5	3	2

Penetration and Critical Range

PEN	61
PENF	31
BC Contact	1722K
Collapse Radius	4
Collapse Radius	1
Collapse Radius	13
Collapse Radius	12

Standing	4
Kneel/Fire Over	3
Hands & Knees	2
Crawl	1
Prone	1

Standing	3
Kneel/Fire Over	2
Hands & Knees	1
Crawl	1
Prone	1

Standing	9
Kneel/Fire Over	6
Hands & Knees	4
Crawl	3
Prone	3

Standing	7
Kneel/Fire Over	5
Hands & Knees	3
Crawl	3
Prone	2

ARTILLERY BURST DATA TABLE

14 180mm HE USSR

			Burst Data: Range from Burst in 2 yard hexes														Penetration and Critical Range	
			0	1	2	3	4	5	6	8	10	12	15	20	30	40		
Airburst	0 - 6	PEN	46	46	46	45	44	44	43	41	40	38	36	32	26	21	PEN	125
		DC	10	10	10	10	10	10	10	10	10	10	10	9	9	8	PENF	69
	7 - 8	PEN	50	50	50	49	49	48	47	46	45	43	42	39	33	29		
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	BC Contact	2292K
	9	PEN	44	44	44	43	43	42	42	41	40	39	37	35	31	27		
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10		
		BSHC	34	32	26	19	14	11	8	5	4	3	2	1	-3	-5		
		BC	247	231	185	140	105	81	64	43	31	23	16	10	5	3		
	0 - 1	ID	5	5	5	4	4	4	3	2	2	1	1					
	2 - 7	ID	8	8	7	7	6	6	5	4	3	3	2	1				
	8 - 9	ID	11	11	10	10	9	8	7	6	5	4	3	2	1			
		BSCC	5	4	4	3	2	2	1	-1	-3	-4	-5	-7	-10			
Burst on Earth	0 - 6	PEN	49	49	48	47	46	45	44	42	40	38	36	32	26	21	Standing	4
		DC	10	10	10	10	10	10	10	10	10	10	10	9	9	8	Kneel/Fire Over	3
	7 - 8	PEN	52	52	51	50	49	49	48	47	45	44	42	39	33	29	Hands & Knees	2
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	Crawl	1
	9	PEN	46	45	45	44	44	43	42	41	40	39	38	35	31	27	Prone	1
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10		
		BSHC	*8	*2	50	22	13	8	6	3	2	1	1	-2	-5	-7	Collapse Radius	6
		BSCC	*15	*4	92	41	23	15	10	6	4	3	2	1	-3	-5		
		BC	56K	6K	791	226	119	75	53	31	21	15	11	7	3	2		
	0 - 1	ID	7	7	6	6	6	5	5	4	4	3	3	2	1	1		
	2 - 7	ID	14	13	13	12	12	11	10	10	9	8	7	5	3	2		
	8 - 9	ID	25	24	23	22	21	20	20	18	17	15	13	11	7	5		
		BSCC	*4	98	25	11	6	4	3	2	1	-1	-3	-5	-8	-10		
Burst on Rock	0 - 6	PEN	49	49	48	47	46	45	44	42	40	38	36	32	26	21	Standing	2
		DC	10	10	10	10	10	10	10	10	10	10	10	9	9	8	Kneel/Fire Over	2
	7 - 8	PEN	52	52	51	50	49	49	48	47	45	44	42	38	33	29	Hands & Knees	1
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	Crawl	1
	9	PEN	46	45	45	44	44	43	42	41	40	39	38	35	31	27	Prone	1
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10		
		BSHC	*12	*3	74	33	18	12	8	5	3	2	1	-1	-4	-6	Collapse Radius	2
		BSCC	*14	*4	88	39	22	14	10	6	4	2	2	1	-3	-5		
		BC	57K	5K	660	252	138	89	64	38	26	19	13	8	4	3		
	0 - 1	ID	2	2	2	2	2	2	2	1	1	1	1					
	2 - 7	ID	4	4	4	4	3	3	3	3	2	2	2	1				
	8 - 9	ID	8	7	7	6	6	6	5	5	4	4	3	2	1	1		
		BSCC	*3	71	18	8	4	3	2	1	-1	-3	-4	-6	-9	-11		
Burst on Sand or Ice	0 - 6	PEN	16	16	15	15	14	14	14	13	12	12	11	9.2	7.0	5.3	Standing	9
		DC	8	8	8	8	7	7	7	7	7	7	7	6	6	5	Kneel/Fire Over	6
	7 - 8	PEN	19	18	18	18	17	17	17	16	15	15	14	13	11	8.7	Hands & Knees	4
		DC	9	9	9	9	9	9	9	9	9	9	9	9	8	8	Crawl	3
	9	PEN	19	19	19	18	18	18	18	17	17	16	15	14	12	10	Prone	3
		DC	10	10	10	10	10	10	10	10	10	10	10	9	9	9		
		BSHC	*5	*1	32	14	8	5	4	2	1	1	-2	-4	-7	-9	Collapse Radius	16
		BSCC	*15	*4	95	42	24	15	11	6	4	3	2	1	-3	-5		
		BC	54K	6K	812	316	174	113	60	34	23	16	11	7	3	2		
Burst in a Flooded Rice Paddy	0 - 6	PEN	12	12	11	11	11	10	9.9	9.4	8.8	8.3	7.6	6.6	4.9	3.6	Standing	7
		DC	7	7	7	7	7	7	6	6	6	6	6	5	4	4	Kneel/Fire Over	5
	7 - 8	PEN	15	14	14	14	14	13	13	13	12	12	11	9.8	8.1	6.6	Hands & Knees	3
		DC	9	9	9	9	9	9	9	8	8	8	8	8	8	7	Crawl	3
	9	PEN	16	15	15	15	15	14	14	14	13	13	12	11	9.5	8.0	Prone	2
		DC	10	10	10	10	10	10	9	9	9	9	9	9	9	10		
		BSHC	*4	*1	26	12	7	4	3	2	1	-1	-3	-5	-8	-10	Collapse Radius	14
		BSCC	*15	*4	94	42	23	15	10	6	4	3	2	1	-3	-5		
		BC	55K	6K	812	315	173	75	51	29	19	14	9	6	3	2		

ARTILLERY BURST DATA TABLE

15 8 inch HE USA

			Burst Data: Range from Burst in 2 yard hexes													
			0	1	2	3	4	5	6	8	10	12	15	20	30	40
Airburst	0 - 6	PEN	36	36	35	35	34	33	33	31	30	28	26	23	18	14
		DC	9	9	9	9	9	9	9	9	9	9	9	8	8	7
	7 - 8	PEN	63	63	63	62	61	60	60	58	56	54	52	48	40	34
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	9	PEN	56	55	55	55	54	53	53	51	50	49	47	43	38	32
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10
		BSHC	38	36	28	21	16	12	9	6	4	3	2	1	-3	-5
		BC	278	260	207	156	117	90	71	47	34	25	18	11	6	4
	0 - 1	ID	5	5	5	4	4	4	3	2	2	1	1			
	2 - 7	ID	8	8	7	7	6	6	5	4	3	3	2	1		
	8 - 9	ID	11	11	10	10	9	8	7	6	5	4	3	2	1	
		BSCC	5	5	4	3	2	2	1	-1	-2	-3	-5	-7	-10	
Burst on Earth	0 - 6	PEN	39	38	37	36	35	34	33	32	30	29	26	23	18	14
		DC	9	9	9	9	9	9	9	9	9	9	9	8	8	7
	7 - 8	PEN	66	66	65	63	62	61	60	58	56	55	52	48	40	34
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	9	PEN	58	58	57	56	55	54	53	52	50	49	47	44	38	33
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10
		BSHC	*11	*3	67	30	17	11	7	4	3	2	1	-1	-4	-6
		BSCC	*16	*4	*1	44	25	16	11	6	4	3	2	1	-3	-5
		BC	70K	7K	893	266	141	90	63	37	25	19	13	8	4	3
	0 - 1	ID	11	11	10	10	9	9	8	7	7	6	5	4	2	1
	2 - 7	ID	22	21	20	20	19	18	17	16	14	13	12	9	6	4
	8 - 9	ID	39	38	37	35	34	33	31	29	27	25	23	19	13	9
		BSCC	*2	54	14	6	3	2	2	-1	-2	-4	-5	-7	-10	-12
Burst on Rock	0 - 6	PEN	39	38	37	36	35	34	33	32	30	29	26	23	18	14
		DC	9	9	9	9	9	9	9	9	9	9	9	8	8	7
	7 - 8	PEN	66	66	65	63	62	61	60	58	56	55	52	48	40	34
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10
	9	PEN	58	58	57	56	55	54	53	52	50	49	47	44	38	33
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10
		BSHC	*14	*3	87	39	22	14	10	5	3	2	2	-1	-3	-5
		BSCC	*16	*4	98	44	25	16	11	6	4	3	2	1	-3	-5
		BC	70K	6K	813	304	164	106	75	45	30	22	15	10	5	3
	0 - 1	ID	2	2	2	2	2	2	1	1	1	1	1			
	2 - 7	ID	4	4	4	4	3	3	3	3	2	2	2	1		
	8 - 9	ID	7	7	7	6	6	6	5	5	4	4	3	2	1	1
		BSCC	*2	60	15	7	4	2	2	1	-2	-3	-5	-7	-10	-12
Burst on Sand or Ice	0 - 6	PEN	39	38	37	36	35	35	33	32	30	29	26	23	18	14
		DC	9	9	9	9	9	9	9	9	9	9	9	8	8	7
	7 - 8	PEN	47	47	46	45	44	44	43	41	40	38	36	33	28	23
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	9
	9	PEN	44	44	43	42	42	41	40	39	38	37	35	33	28	24
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10
		BSHC	*8	*2	50	22	13	8	6	3	2	1	1	-2	-5	-7
		BSCC	*17	*4	*1	46	26	17	12	6	4	3	2	1	-3	-5
		BC	66K	7K	940	357	194	99	68	39	26	19	13	8	4	3
Burst in a Flooded Rice Paddy	0 - 6	PEN	31	30	29	29	28	27	26	25	24	22	20	18	14	10
		DC	9	9	9	9	9	9	9	8	8	8	8	8	7	6
	7 - 8	PEN	32	32	31	31	30	30	29	28	27	26	24	22	18	15
		DC	10	10	10	10	10	10	10	10	10	9	9	9	9	8
	9	PEN	32	32	31	31	30	30	29	28	27	26	25	23	20	17
		DC	10	10	10	10	10	10	10	10	10	10	10	10	9	9
		BSHC	*7	*2	45	20	11	7	5	3	2	1	-1	-3	-6	-8
		BSCC	*17	*4	*1	46	26	17	11	6	4	3	2	1	-3	-5
		BC	67K	7K	940	356	194	92	63	37	24	18	12	7	4	2

Penetration and Critical Range

PEN	102
PENF	54
BC Contact	2836K

Standing	4
Kneel/Fire Over	2
Hands & Knees	2
Crawl	1
Prone	1
Collapse Radius	5

Standing	3
Kneel/Fire Over	2
Hands & Knees	1
Crawl	1
Prone	1
Collapse Radius	2

Standing	7
Kneel/Fire Over	5
Hands & Knees	3
Crawl	3
Prone	2
Collapse Radius	14

Standing	7
Kneel/Fire Over	5
Hands & Knees	3
Crawl	3
Prone	2
Collapse Radius	13

ARTILLERY BURST DATA TABLE

16 16 inch HE USA naval

			Burst Data	Range from Burst in 2 yard hexes												Penetration and Critical Range	
			0	1	2	3	4	5	6	8	10	12	15	20	30	40	
Airburst	0 - 6	PEN	136	136	135	135	134	133	132	130	128	126	122	117	107	98	PEN 783
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	PENF 478
	7 - 8	PEN	103	103	103	103	102	102	101	100	99	97	95	92	86	81	
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	BC Contact 21454K
	9	PEN	91	91	90	90	90	89	89	88	87	86	84	82	77	73	
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
		BSHC	31	29	23	18	13	10	7	4	3	2	1	0	-4	-6	
		BC	1K	938	704	497	349	254	192	120	83	61	42	26	13	8	
	0 - 1	ID	5	4	4	4	3	3	3	2	1	1					
	2 - 7	ID	7	7	7	6	6	5	4	3	3	2	1				
	8 - 9	ID	10	10	10	9	8	7	7	5	4	3	2	1			
		BSCC	11	11	8	6	4	3	2	1	1	0	-2	-4			
Burst on Earth	0 - 6	PEN	140	139	138	137	135	134	133	131	128	126	123	117	107	98	Standing 4
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	Kneel/Fire Over 2
	7 - 8	PEN	105	105	104	104	103	102	102	100	99	98	96	92	86	81	Hands & Knees 2
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	Crawl 1
	9	PEN	92	92	91	91	90	90	89	88	87	86	85	82	77	73	Prone 1
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
		BSHC	*9	*2	58	25	14	9	6	3	2	1	1	-2	-5	-7	Collapse Radius 14
		BSCC	*13	*3	82	36	20	13	9	5	3	2	1	-1	-4	-6	
		BC	521K	44K	4K	1K	474	273	180	98	64	45	30	19	9	6	
	0 - 1	ID	32	31	30	28	27	26	25	23	21	20	17	14	9	6	
	2 - 7	ID	62	61	59	57	55	53	51	48	45	42	38	32	22	16	
	8 - 9	ID	109	108	105	102	99	96	93	88	83	78	72	62	46	35	
		BSCC	*9	*2	56	25	14	6	6	3	2	1	1	-3	-5	-7	
Burst on Rock	0 - 6	PEN	140	139	138	137	135	134	133	131	128	126	123	117	107	98	Standing 3
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	Kneel/Fire Over 2
	7 - 8	PEN	105	105	104	104	103	102	102	100	99	98	96	92	86	81	Hands & Knees 1
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	Crawl 1
	9	PEN	92	92	91	91	90	90	89	88	87	86	85	82	77	73	Prone 1
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
		BSHC	*11	*3	71	31	17	11	7	4	2	1	1	-2	-5	-7	Collapse Radius 6
		BSCC	*13	*3	80	35	20	12	8	5	3	2	1	-1	-4	-6	
		BC	517K	41K	4K	1K	539	314	208	114	74	53	36	22	11	7	
	0 - 1	ID	7	7	7	6	6	5	5	4	4	3	3	2	1		
	2 - 7	ID	13	13	12	12	11	10	10	9	8	7	6	4	2	1	
	8 - 9	ID	22	22	21	20	19	18	17	16	14	13	11	9	5	3	
		BSCC	*15	*4	94	41	23	15	10	5	3	2	1	0	-4	-6	
Burst on Sand or Ice	0 - 6	PEN	140	139	138	137	135	134	133	131	128	126	122	117	107	98	Standing 7
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	Kneel/Fire Over 5
	7 - 8	PEN	105	105	104	104	103	102	102	100	99	96	96	92	86	81	Hands & Knees 4
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	Crawl 3
	9	PEN	92	92	91	91	90	90	89	88	87	86	85	82	77	73	Prone 3
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
		BSHC	*8	*2	49	22	12	7	5	3	1	1	0	-3	-6	-8	Collapse Radius 32
		BSCC	*14	*3	86	38	21	13	9	5	3	2	1	-1	-4	-6	
		BC	488K	44K	5K	1K	649	295	191	103	66	47	31	19	9	6	
Burst in a Flooded Rice Paddy	0 - 6	PEN	140	139	138	137	135	134	133	131	128	126	123	117	107	98	Standing 6
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	Kneel/Fire Over 4
	7 - 8	PEN	105	105	104	104	103	102	102	100	99	98	96	92	86	81	Hands & Knees 3
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	Crawl 3
	9	PEN	92	92	91	91	90	90	89	88	87	86	85	82	77	73	Prone 2
		DC	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
		BSHC	*8	*2	48	21	12	7	5	3	1	1	-1	-3	-6	-8	Collapse Radius 28
		BSCC	*14	*3	85	37	21	13	9	5	3	2	1	-1	-4	-6	
		BC	495K	45K	5K	1K	642	279	181	97	63	44	30	18	9	6	

WHITE PHOSPHORUS DATA TABLE

Shell Index	White Phosphorus Data	Range from Burst in 2 yard hexes																
		C	0	1	2	3	4	5	6	7	8	9	10	11	12	14	16	20
1 Mortar Shell	BWPHC	*23	*6	*1	35	16	9	6										
	PD Body	13	13	12	11	9	8	6										
	PD Limb	3	3	3	3	3	2	2										
	PDs TS 0	69H	304	13	1													
	PDs TS 4	51K	23H	100	4	1												
60mm	PDs TS 7	233K	10K	455	20	3	1											
2 Mortar Shell	BWPHC	*24	*6	*1	37	17	9	6	4	3	2	2	1					
	PD Body	75	74	73	69	65	60	55	50	45	40	34	29					
	PD Limb	12	12	11	11	11	10	9	9	8	7	7	6					
	PDs TS 0	26K	12H	51	2													
	PDs TS 4	196K	87H	384	17	3	1											
81mm 82mm	PDs TS 7	889K	39K	17H	77	12	3	1	1									
3 Mortar Shell	BWPHC	*36	*9	*2	56	25	14	9	6	5	3	3	2	2	2	1	1	-2
	PD Body	427	424	419	408	396	384	371	357	343	328	313	297	281	265	233	201	138
	PD Limb	41	41	41	40	39	38	37	36	35	34	33	32	30	29	27	24	18
	PDs TS 0	190K	84H	371	16	3	1											
	PDs TS 4	1M	63K	28H	123	20	5	2	1									
107mm	PDs TS 7	6M	284K	13K	554	89	24	9	4	2	1	1						
4 Mortar Shell	BWPHC	*38	*9	*2	59	26	15	9	7	5	4	3	2	2	2	1	1	-2
	PD Body	427	424	419	408	396	384	371	357	343	328	313	297	281	265	233	201	138
	PD Limb	41	41	41	40	39	38	37	36	35	34	33	32	30	29	27	24	18
	PDs TS 0	212K	94H	413	18	3	1											
	PDs TS 4	2M	70K	31H	137	22	6	2	1									
120mm	PDs TS 7	7M	317K	14K	618	100	27	10	4	2	1	1						
5 Artillery Shell	BWPHC	*40	*10	*3	63	28	16	10	7	5	4	3	3	2	2	1	1	-2
	PD Body	427	424	419	408	396	384	371	357	343	328	313	297	281	265	233	201	138
	PD Limb	41	41	41	40	39	38	37	36	35	34	33	32	30	29	27	24	18
	PDs TS 0	235K	10K	458	20	3	1											
	PDs TS 4	2M	78K	34H	151	24	7	2	1	1								
105mm	PDs TS 7	8M	351K	16K	685	111	30	11	5	2	1	1						
6 Artillery Shell	BWPHC	*56	*14	*4	88	39	22	14	10	7	6	4	4	3	2	2	1	1
	PD Body	673	670	663	648	633	616	599	581	563	544	524	504	483	462	419	376	289
	PD Limb	57	57	56	56	55	54	52	51	50	49	48	46	45	44	41	37	31
	PDs TS 0	600K	27K	12H	52	8	2	1										
	PDs TS 4	4M	198K	88H	387	62	17	6	3	1	1							
122mm	PDs TS 7	20M	898K	40K	18H	283	77	28	12	6	3	2	1	1	1			
7 Artillery Shell	BWPHC	*65	*16	*4	*1	45	25	16	11	8	6	5	4	3	3	2	2	1
	PD Body	823	819	811	794	777	758	739	719	698	676	654	631	608	585	536	487	388
	PD Limb	66	66	65	64	63	62	61	60	59	57	56	54	53	52	48	45	38
	PDs TS 0	900K	40K	18H	78	13	3	1	1									
	PDs TS 4	7M	298K	13K	581	94	26	9	4	2	1	1						
130mm	PDs TS 7	30M	1M	60K	26H	424	116	43	19	9	5	3	2	1	1			
8 Artillery Shell	BWPHC	*98	*24	*6	*2	68	38	24	17	12	10	8	6	5	4	3	2	2
	PD Body	12H	12H	12H	11H	11H	11H	11H	10H	10H	995	968	940	911	882	822	761	637
	PD Limb	85	85	85	83	82	81	80	78	77	76	74	73	71	69	66	62	55
	PDs TS 0	2M	106K	47H	208	34	9	3	1	1								
152mm	PDs TS 4	18M	797K	35K	16H	251	69	25	11	6	3	2	1	1				
155mm	PDs TS 7	82M	4M	159K	70H	11H	311	114	50	25	14	8	5	3	2	1	1	
9 Artillery Shell	BWPHC	*147	*37	*9	*2	*1	57	37	25	19	14	11	9	8	6	5	4	2
	PD Body	19H	19H	18H	18H	18H	17H	17H	17H	17H	16H	16H	15H	15H	15H	14H	13H	11H
	PD Limb	119	119	118	116	115	113	112	110	109	107	105	104	102	100	96	92	84
	PDs TS 0	7M	307K	14K	600	97	27	10	4	2	1	1						
	PDs TS 4	52M	2M	102K	45H	724	198	73	32	16	9	5	3	2	1	1		
180mm	PDs TS 7	235M	10M	460K	20K	33H	898	329	145	72	40	23	15	9	6	3	2	1
10 Artillery Shell	BWPHC	*158	*40	*10	*2	*1	62	40	27	20	15	12	10	8	7	5	4	2
	PD Body	24H	24H	24H	24H	23H	23H	23H	22H	22H	21H	21H	20H	20H	20H	19H	18H	16H
	PD Limb	143	143	142	141	139	138	136	134	133	131	129	127	125	123	119	115	106
	PDs TS 0	10M	425K	19K	830	134	37	13	6	3	2	1	1					
	PDs TS 4	72M	3M	140K	62H	10H	274	101	44	22	12	7	4	3	2	1	1	
8 inch	PDs TS 7	326M	14M	636K	28K	45H	12H	455	200	100	55	32	20	13	9	4	2	1

PHOENIX COMMAND™

Artillery System

"Artillery is the God of War." - Stalin

This Artillery System is designed for use with the **Phoenix Command Combat System**. It allows players to add the full range of Indirect Fire weaponry to Phoenix Command, and includes:

Fire Missions, from the first Ranging shot, through Adjusting Fire, to sustained Fire For Effect by individual weapons or complete Batteries.

Forward Observers, with everything necessary for calling in fire, including Forward Observer and Battery errors, Weather corrections, and Forward Observer Skill.

Direct Fire, for the defense of Fire Bases and other last-ditch actions.

Defensive Positions, showing the effects of artillery fire on Buildings, Foxholes, and Trenches, as well as in Forests and Jungles.

Air and Ground Bursts, and their effects in various situations.

Complete Weapon Data for a wide range of Guns, Howitzers, Mortars, and Rockets from World War II to the present, including British, German, Soviet, and United States weapons.

Illustrated and developed with the same techniques as other **Phoenix Command** products, this System is compatible with the entire **PC** line and includes everything necessary to add Artillery Fire Missions to the game.

The Revolution in Game Design Continues!

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PHOENIX COMMAND MENTAL DAMAGE SYSTEM

Rules Created by
Cpl Ferro

Edited by
Pvt Kastro

1. INTRODUCTION

Credit to R.J. Andron of www.phoenixcommand.com for the inspiring Integrated Morale Rules.

Herein is my attempt to come up with some decent insanity rules for PCCS, to allow it to simulate mind-bending situations all the way from incidental phobias up to full-on fright-film scenarios. In so doing, I needed to design into it an understanding of what sanity actually is and generally why some people lose it and not others. You probably won't agree with this understanding, but that just means that one of us is crazy… and that's rather appropriate, don't you think?

2. INCAPACITATION

A **Knockout Roll** is required whenever a character:

1) Senses the presence of an inimical creature or hostile animal, or anticipates combat, and/or
2) Reacts fearfully to some unexpected circumstance.

Each fearful thing encountered is measured in **Shock Points (SP)**, which are the fuel of fear. There are two types of SP: **Acute SP**, are those which affect a character instantly, akin to an electric shock, or being surprised by something terrible. Acute SP is what can panic someone or freeze them with fear. **Chronic SP**, are those which settle in the depths of the mind, eating away at sanity.

Below are some sample **KV** and **SP** values. The GM must arbitrate these values for the specific personalities of the characters. A wolf-trapper, for instance, will probably be inured to most fear of wolves.

Sample KV Stereotypes

Six year old child	2
Housewife	3
Grown man	5
Street tough	10
Crack combat vet	38
Bushido-code samurai	90

KV Modifiers

Adrenalin Rush	x5.0

Sample Acute SP Values (see also **Stress-Induced Illness**, below)

Surprised by popped paper bag	1
Argue seriously with an acquaintance	2
Argue seriously with a stranger	4
Alone, walk through an unlit park with no moon	5
Alone, lost in the woods at night	10
Broken arm	15
Anticipate an imminent fight with a stranger	20
Surprised by 4” long scorpion (e.g. open drawer)	30
Blair Witch creepiness, per night	50
Heather discovering the bundle	90
Alone at night, encounter a hungry Timber Wolf	150
Alone at night, chased by pack of Timber Wolves	300

PCCS Conversions

Acute shock points (broken bone)	SP/10
Chronic shock points (stomach ache)	SP
Physical injury to skull	PD/10
Physical injury elsewhere	PD/50

SP Modifiers

Creatures outnumber characters by 2 to 1	x1.5
Creatures outnumber characters by 4 to 1	x1.8
Creatures outnumber characters by 8 to 1	x2.0
Creatures outnumber characters by 16+ to 1	x3.0
Phobia	x10.0

Total all **Acute SP**, and add that to any **Chronic SP** (see below) the character may have. Compare the result to his **Knockout Value** (**KV**), and roll a 00 - 99 number on the table below. If the **SP Total** is equal to or less than **1/10** of his KV, the character does not need to roll.

Temporary Incapacitation Table

SP Total	KO	Stun	Daze	Disor	Fright	Caut	Bold
SP > 1/10 KV	00-00	01-02	03-05	06-09	-	10-49	50-99
SP > KV	00-02	03-08	09-16	17-24	25-49	50-97	98-99
SP > 2 * KV	00-13	04-31	32-52	53-74	76-89	90-97	98-99
SP > 3 * KV	00-26	27-53	54-82	83-97	-	-	98-99
SP 200+	00-60	61-94	95-96	97-97	-	-	98-99

KO = Knockout. The character loses **2 Wpr** (see below) and is unconscious. The time he remains unconscious is taken from the **Incapacitation Time Table** (**8B**, below), and double the result.
Wpr: If the character spends **4 Wpr**, use the **Frightened** entry instead.

Stun = Stunned. The character loses **1 Wpr** (see below) and is semi-conscious with terror but incapable of action or coherent thought. **Incapacitation Time** is taken from **Table 8B**.
Wpr: If the character spends **2 Wpr**, use the **Frightened** entry instead.

Daze = Dazed. The character is panicked, and if there is no support available, he drops to the ground conscious but incapable of offensive action or thought, else he clings to the support. After half a second, a Dazed character may flee and take non-offensive actions at ½ normal efficiency. **Incapacitation Time** is taken from **Table 8B** with a **-1** modifier to the 0 - 9 roll.
Wpr: If the character spends **1 Wpr**, use the **Frightened** entry instead.

Disor = Disoriented. The character is panicked, but is fully functional and may flee, cry for help, pull a trigger, slam a door, or duck to save himself. Except for reflexive action, the character is incapable of offensive action and may not advance toward the menace. **Incapacitation Time** is taken from **Table 8B** with a **-2** modifier to the 0 - 9 roll.
Wpr: If the character spends **1 Wpr**, use the **Frightened** entry instead.

Fright = Frightened. The character acts normally, except that all offensive action is conducted at ½ efficiency.
Wpr: If the character spends **1 Wpr**, use the **Cautious** entry instead.

Caut = Cautious. This is the normal condition of characters in a “horror” scenario. All offensive action is conducted at ¾ efficiency.
Wpr: If the character spends **4 Wpr**, use the **Bold** entry instead. (This cost is high to remind the player that he is hurling caution to the wind, disobeying his body’s urgent warnings.)

Bold = Bold. The character is fully capable of action. A roll result of **98 - 99** on the **Temporary Incapacitation Table** indicates an adrenalin rush.

Incapacitation Time Table (8B)

SP	Random Roll (0-9)					
Total	**0**	**1-2**	**3-5**	**6-7**	**8**	**9**
0	1p	1p	2p	4p	6p	11p
50	4p	15p	29p	47p	73p	4m
100	25p	3m	5m	9m	14m	25m
200+	3m	11m	21m	23m	53m	96m

p = 2-second Phases, m = Minutes

A character who recovers from an incapacitation, becomes **Frightened**, remaining so until an hour after he has reached a safe, secure environment. If during that hour, he is shocked again, begin timing again.

Willpower (Wpr): All characters start with a certain amount of **Wpr** to spend, equal to their **WIL**. To give players more choice in how their character responds to danger, they may spend Wpr (as mentioned in the incap. listings above), to avoid incapacitation. Notes:

1. If a character's Wpr is reduced to either ½, or **4 or less** of his **WIL** (whichever comes first), then his long-term motivation is at **three-quarters**, and he is in a **Disoriented/Panicked** state until he recovers that threshold, insisting on leaving ASAP for a place of relative safety. He won't fight or help search for anything or anyone. If attacked, he flees.
2. If a character's Wpr is reduced to **0**, his long-term motivation is at **half**, and he is in a **Stunned** state until he recovers at least **1 Wpr**, but remains capable of very slowly obeying simple, innocuous commands.
3. A character regains Wpr, when, while in a secure environment, he eats a meal, imbibes refreshments, gets sleep, or is inspired by beauty. Any such act grants from **1 - 3 Wpr**. A character may regain Wpr equal to **no more than ¼ his WIL per 24 hours**, and may never regain to Wpr to beyond his **WIL**.

INSANITY

One-tenth of all **Acute SP** a character sustains, remains with him as **Chronic SP**. Do not round off until actually using the **Insanity Table** (see below). To determine whether a character sustains any long-term injuries from his experiences, multiply total **Chronic SP** by **10**, and divide by his **Sanity** (**San**), which equals the sum of his **Leadership** (**LDR**), **Moral Fitness SAL***, and his (**Learning Roll** minus ten, divided by **10**), rounded off. Rephrasing:

San = (LDR + Moral Fitness SAL*) + [(LR-10) / 10]

As this value will rarely change, it can easily be figured beforehand.

*** Skill Accuracy Level**. There's no other term for this, for consistency with the main PCCS rules. It is based on the skill, found on the table below. For those not playing PCCS, the **SAL** can easily be substituted for the **Moral Fitness** score itself.

Moral Fitness SAL

Fitness	SAL	Fitness	SAL
0	5	3	10
1	7	4	11
2	9	etc.	etc. (increasing by 1 per level)

Skill Tradeoffs & Calculating Moral Fitness:

1. Note that especial non-Classical, mind-stilling meditative arts, termed here the **Meditation Skill**, such as Zen or Raja Yoga, trade off to **Moral Fitness** at ½, rounding off, and vice versa. Thus, a Zen Grandmaster (Meditation SL 15), would have an effective minimum **Moral Fitness** SL of 8. Were he to enter into a program of Classical spiritual exercises, any new experience would be added on top of that experience.
2. The following skills trade off to **Moral Fitness**, as shown. In this instance only (and including Meditation, above), all accrued skill levels are cumulative, rounding off at the end.

    Exorcism / 4.
    Theology / 10
    Classical Art Specialty / 20
    Science Specialty / 20

    Example: An investigator has Meditation 4, Exorcism 4, Theology 8, Literature 9, and Astronomy 10. His minimum Moral Fitness is therefore 2 + 1 + 0.8 + 0.45 + 0.5 = 4.75, rounding to SL 5.

Moral Fitness Skill: A mixture of effort and efficacy of pursuit of knowledge and relationships with man and the universe, which develop the agapic, cognitive quality which sets man apart from the beasts, and allows for successful survival of the race by allowing man to develop his masterful relationship with the universe. Moral Fitness is developed through what are called "spiritual exercises", namely things such as working through ontological paradoxes via the Socratic method, as in the dialogues of Plato, and otherwise akin to that, participating in the discovery and transmission of universal principles, as by engaging in Classical art or science, which amount to the same thing. Moral Fitness can (but is not the only means to) increase a person's confidence, motivation, calm, and intelligence (though it is the sole means of increasing cognition per se, whether its practitioners know this or not).

On the **0 - 20** skill scale, here are both skills and their descriptions:

Physical Fitness		Moral Fitness
0	Invalid	Bona fide Nietzschean
1	Couch potato	Raised by television
2	Comp. Jockey	Bona fide Pentecostal
3	Stroller	Phoenix Command Nut
4	Walker	Bona fide Calvinist
5	Speed-Walker	Bona fide Catholic
6	Jogger	Philosopher
8	Boot camp	Jeanne D'Arc
10	Drill Sgt.	Classical Scientist/Artist
12	Olympian	The Pope
15+	Ubermensch	Philosopher-King

Enter the adjusted **Mental Damage Total** on the following table, to find the odds of sustaining various types of long-term injuries. Roll a **00 - 99** number once, and write down the number. On the appropriate row, for each column entry which the roll is equal to or less than, that level of injury is sustained. Thus, a character may sustain multiple levels of injury at once.

Insanity Table

Mental Damage Total	Healing Time HT	CTP	1	2	3	4	5
1	1d		00				
2	2d		01				
3	3d		02	00			
4	5d		03	01			
5	7d	12h	04	02			
10	14d	10h	09	06			
15	21d	8h	13	09			
20	30d	6h	17	12	03		
25	38d	5h	21	16	03		
30	43d	4h	25	19	04		
35	48d	3h	29	22	05	01	
40	60d	2h	32	25	06	02	
45	90d	1h	35	28	07	03	
50	120d	1h	38	30	08	04	
60	150d	1h	44	35	09	05	
70	180d	45m	49	40	11	05	
80	210d	30m	54	44	13	07	
90	240d	15m	58	48	15	07	
100	270d	10m	62	52	16	08	
200	300d	3m	86	77	31	16	02
300	1yr	10p	94	88	43	24	04
400	1.5yr	2p	97	94	53	31	06
500	2yr	2p	98	96	61	37	08

600	3yr	dur	98	97	68	43	10
700	4yr	dur	98	98	73	48	12
800	5yr	dur	98	98	78	53	14
900	6yr	dur	98	98	82	57	16
1000	7yr	dur	99	98	85	62	18
2000	8yr	dur	99	99	96	85	34
3000	9yr	dur	99	99	98	93	46
4000	10yr	dur	99	99	98	96	57
5000	11yr	dur	99	99	98	97	65
6000	12yr	dur	99	99	98	98	72
7000	13yr	dur	99	99	99	98	77
8000	14yr	dur	99	99	99	98	81
9000	15yr	dur	99	99	99	98	84
12000	20yr	dur	99	99	99	99	91
16000	40yr	dur	99	99	99	99	95
20000	55yr	dur	99	99	99	99	97
40000	80yr	dur	99	99	99	99	98
60000	100yr	dur	99	99	99	99	99
80000	300yr	dur	99	99	99	99	99
100000	900yr	dur	99	99	99	99	99

p = Phases; m = Minutes; h = Hours; d = Days; yrs = Years

HT = Healing Time. This is the amount of time it takes for the Mental Damage Total to be removed. To prorate for any given stage in the recovery process, find the Mental Damage listing for the remaining time. Thus, if a character sustained 7 chronic SP, healing time 7 days, then after two days, his total would become 4.

CTP = Critical Time Period. If the character is given successful emergency psychiatric aid within this time after he has made his **Knockout Roll**, then he may reduce his Mental Damage Total by a certain amount (see Psychiatry Skill, below). The listing "**dur**" means that aid can only take effect if it is, somehow, actually administered during the traumatic episode. Unfortunately, most patients at that level will not notice the psychiatrist, and therefore administering aid will be impossible.

1 = Traumatised. The character is shaken for a prolonged period, and will typically suffer nightmares, phobia, amnesia, or even extended catalepsy, and other deleterious effects. Recovery follows normal Mental Damage recovery (i.e. when all **Chronic SP** are healed, the trauma is fully recovered from, at least in these terms – scars will remain). In any trying situation the character is treated as automatically **Frightened**.

2 = Neurotic. The character's mind is permanently altered by his experience in some severe way. He will probably suffer post-traumatic stress disorder for the rest of his life, but may also or instead suffer some kind of schizophrenia. As a guide, full recovery time is on the order of **Mental Damage Total * (10) months**.

Type **2**, **3**, and **4** recovery times are concurrent. In the presence of trigger circumstances (determined by the GM), treat the character as **Disoriented**.

3 = Psychotic. The character's mind is permanently altered by his experience in some grotesque way, whether visibly or invisible. Paranoid schizophrenia is possible for those with such tendencies (or perhaps even those without). Recovery from this state will typically be slow and very difficult, if possible at all. As a guide, full recovery time is on the order of **Mental Damage Total * (10) months**. Type **2**, **3**, and **4** recovery times are concurrent. In the presence of trigger circumstances (determined by the GM), treat the character as **Dazed**.

4 = Mindless. The character is essentially mindless, either in a cataleptic shock, a coma, or otherwise fantastically incapacitated by insanity. Recovery will typically be slow and exceedingly difficult, on the order of years, if possible at all. As a rule, full recovery time in on the order of **Mental Damage Total * (10) months**. Type **2**, **3**, and **4** recovery times are concurrent. Treat the character as **Stunned** for the duration.

5 = Dead. The character is overwhelmed by the shock to his system, and dies, as of a heart attack, stroke, total brain shutdown, etc. Apply his Mental Damage Total as actual **Physical Damage** (**PD**) for the purpose of medical aid, incapacitation time, and potential resuscitation. Treat the character as **Knocked Out**, if prompt medical aid is conceivable.

Permanent Mental Injuries: A person who has gone insane with fear, horror, pain, or stress, will be less resistant to subsequent shocks, even once cured. Use the following table as a guideline, though the GM should apply his own rules for special situations (e.g. a character with low WIL may increase it while manic, etc.):

Permanent Mental Injury Table

Insanity Level	WIL/LDR
Traumatised	-2
Neurotic	-4
Psychotic	-8
Mindless	-16

Therapy (see **Psychiatry**, below) allows the character to regain back half of what he lost. Therapy can never reduce the penalty to that for one category less severe. E.g. A Neurotic character who lost 4 WIL and LDR, then was cured of his Neurosis (while remaining Traumatised), would regain 2 WIL and 2 LDR. Further therapy could cure his trauma, but he would never regain further WIL or LDR in that way.

Note that altering **WIL** by extension alters **KV** and **LR**.

Moral Fitness Effects: Whenever a character goes insane, it becomes, by definition, a questioning event for his faith. There are two concerns here.

1. How much the person's **Moral Fitness** is reduced. As only rational faith is sane, only rationality can rationalise questions of faith, in a manner as to truly sustain it. The character makes an **INT** roll: if he fails, he loses **Learning Points** equal to his **Mental Damage Total**. If he succeeds, he loses **LP** equal to his **Mental Damage Total / 10**.

2. In situations where the nature of the evidence inverts the very foundation for faith itself (see my post, linked to below), the degree of faith is actually an impediment to sanity. In these cases (whether or not said foundation is actually inverted, rather than merely perceiving to have been so), the character must make an **INT** roll: if he succeeds, he gains **Acute SP** equal to his **Learning Point Total * 10** for Moral Fitness. If he fails, he gains **Acute SP** equaling his **LPT**. In either case his **LPT** is then reduced to **0**.

If the revelation is spread out, as through a person brooding on some inexplicable yet unsettling clue he has discovered, slowly fathoming its significant, prorate its **Acute SP** value – there is less chance of immediate panic, but the ultimate spiritual effect is the same. Once such a revelation has begun, it begins working through the mind like an acid. A character who makes some kind of perceptiveness or self-awareness roll (in PCCS, either raw Telepathic Sensitivity, or a skill out of either Psychology, Theology, Moral fitness, Perception, or Traps & Spotting) has a terrible, preconscious premonition of where his thoughts are leading to. Generally, such characters attempt to drown out the looming knowledge through drug additions, prayer, running away, and the like. Every **20 - INT** weeks, he must sacrifice a point of permanent long-term motivation (**MOT**) to avoid the revelation, or else his **Chronic SP** accrual continues. During this time the character may not recover from insanity (but he may recover from Incapacitation). Each said time increment, he must check for suicide: If he rolls above his long-term motivation (MOT), he is suicidal. If he then rolls equal to or less than his **WIL**, he spends all his **Wpr** and attempts suicide. If the player feels it is in character, he may spend **2 Wpr** to resist making the attempt. This continues until he either dies, deals with the revelation, or reaches **0 MOT**. At 0 MOT he is in a state of pure and exhausted cognitive dissonance, dividing his **SAN** by **10** for the purposes of resisting the ultimate revelation. He is no longer capable of volition, and will probably eventually rot away of bedsores or die of the flu unless tenderly and constantly treated.

CoC: Transcript of a Tape-Recorded Psychiatric Session
http://forum.rpg.net/showthread.php?s=f648351337401abdb10fec52c024256f&threadid=35526

PSYCHIATRY SKILL

This skill is modified by **Teaching** (TCH) and **Telepathic Sensitivity** (TS) characteristics. This skill allows the character to perform emergency psychiatric aid on a patient. The maximum **Mental Damage Total** which a given skill level can attend, is given below.

Expertise Requirement Table

Mental Damage Total	Psychiatry Skill Level Needed
5+	4 (Crisis Centre Help)
30	6 (Therapist)
50	8 (Psychiatrist)
100	10 (Excellent Psychiatrist)
200+	12 (Renowned Specialist)

If sufficient aid is administered, the person's **Mental Damage Total** may be immediately halved.

If a REM-suppressing soporific is administered, the person is rendered unconscious for the duration (varies), and his **CTP** is frozen, resuming countdown when he awakes. If REM is not suppressed, the person's **CTP** is multiplied by **100**. Forcing a pill or an injection on someone already panicked induces an additional **50 Acute SP**; if the person is both insane and panicking, it induces **500 Acute SP** instead.

If an insufficient skill level is present, the person may attempt a Psychiatry skill roll, in order to partially stabilise the patient until he can be gotten to a hospital or other care facility with the needed expertise. Treat the task as being easy for the needed skill level (listed above), and prorate the odds for the less-skilled, from there. The GM should apply appropriate modifiers if the problem is compounded by distractions, background noise, injuries, or even an ongoing assault. If the interim skill roll is made, increase the patient's **CTP** remaining by the original **CTP times the amount succeeded + 2**. If a person is calmed sufficiently to allow him to willfully take a sedative of some kind, his **Mental Damage Total** may be temporarily halved for the duration, only for the purposes of attaining sufficient aid.

Example: One night at an unsupervised party, Jonas has takes a severe overdose of lysergic acid, sustaining 200 Chronic SP. After 30 minutes of the trip the GM demands an Insanity roll; Jonas rolls a 20 and goes psychotic. His Critical Time Period is 3 minutes. His friends, themselves only partially aware, and squabbling about what to do, decide two minutes later to try to calm him down. Despite the distractions one of them makes his unskilled Psychiatry roll, succeeding by 0, and therefore increasing his CTP by 6 minutes. They bring him to a next-door neighbour's house, who is a friendly registered nurse (SL 4), and whose roll succeed by 2, thus calming him for an additional 12 minutes. They drive to the hospital through the lonely streets, reaching the sanitarium where a psychiatrist (SL 8) is working late. He realises that they need a specialist, and succeeds in his roll by 6, calming Jonas for 24 minutes, or long enough to convince him to take some anti-psychotic medication and a soporific, which renders him unconscious for the night (freezing his CTP and artificially decreasing his Mental Damage Total to 100). They restrain him in a hospital room and the doctor

makes an appointment with a specialist for the next day. When Jonas awakens, as specialist (SL 10) is waiting for him, who is capable of treating him because he was temporarily reduced to Mental Damage Total 100. This proper treatment makes that reduction permanent. Reapplying his roll of 20 to the 100 row on the Insanity Table, he is removed from his psychotic state, and is instead now only heavily neurotic. Jonas will need months of therapy to recover.

A note on groups: A big risk in chaotic situations is that not everyone will recognise, or have enough sense to defer to the most capable person there. Anyone who wishes to take charge, must make a **Leadership** roll, cumulatively modified negatively by any Will bonus of anyone present. If no one succeeds, there is chaos. Whoever beats all comers by **0 - 2**, causes an argument of command, taking **10 Phases** (20 seconds), whereupon new rolls may be made. Whoever beats all comers by **3+**, takes charge and cows all others for the next **Minute**. Arguments should be roleplayed out normally, and the real time taken, used as game time for the purposes of the patient's **CTP** running out. Note that a person with high **Leadership** may thus easily take charge, but aside from maintaining order, he may not be person needed for the task at hand – and may not be smart enough to realise it!

Therapy: A psychiatrist of sufficient skill (see above) may attempt to cure an insane character, by applying therapy, psychoanalysis, drugs, and the like. For the purpose of these rules, think along the lines of a Psychiatry skill roll, modified by various circumstances, as situation, personality differences, subsequent trauma, drug effects, head injuries, relationships, and so on – on other words, this presents a distinct roleplaying opportunity. The GM may consult medical manuals and other references to devise a particular mental illness complex for the player to deal with as an ongoing in-game puzzle (possibly secretly insoluble!), without simply flatly declaring a diagnosis. If the psychiatrist in charge makes a diagnosis, the GM should roll the result secretly, as even psychiatrists make mistakes. As a rule, a cure may be attempted once every **(6)** months. Success will extinguish the most extreme column-result the character suffers. Thus, a **Mindless** person will be coaxed down into mere **Psychosis**.

Therapy can also tend to **Permanent Mental Injuries** (see above).

STRESS-INDUCED ILLNESS

Major life changes of any kind can, alone or cumulatively, weaken a person's will to life and immune system, making them more prone to illness. To determine the chance of a person falling ill over various time periods, enter his **Mental Damage Total** (determined above), on the **Stress-Induced Illness Table** below. Include **Chronic SP** accumulated from the **Major Life Change** table following. The nature and severity of the illness is left to the GM.

Stress-Induced Illness Table

Chronic SP Total For That Year	Illness Chance Bi-Yearly	Yearly	Bi-weekly
2000	98	90	11
1500	97	82	08
1000	96	77	06
700	95	74	05
500	94	73	04
400	79	59	01+
300	69	47	01
200	50	25	00
150	24	15	
100	11	04	
70	04	01	
45	01		
30	00		

Major Life Change Table

Chronic SP	Event
10	Spouse dies
7	Divorce
7	Marital separation
6	Detained in jail or institution
6	Death of close family member or old, close friend
5	Personal injury/major illness
5	Marriage
5	Fired from job
5	Marital reconciliation
5	Retirement
4	Health change, family member
4	Pregnancy
4	Sex difficulties
4	Gain new family member
4	Business readjustment
4	Change in financial state
4	Death of close friend
4	Change in line of work
4	Increased disputes with spouse
3	Large mortgage
3	Foreclosure, mortgage or loan
3	Change in responsibilities at work
3	Child leaves home
3	In-law trouble
3	Outstanding personal achievement

3	Spouse starts or stops work
3	Start or finish school
3	Change in living conditions
2	Revise personal habits
2	Trouble with boss
2	Change working hours or conditions
2	Change in residence
2	Change schools
2	Change in recreation
2	Change in church activities
2	Change in social activities
2	Loan on car, major appliances
2	Change in no. of family get-togethers
2	Change in sleeping habits
2	Change in eating habits
1	Busy Christmas
1	Major Vacation
1	Minor traffic violation

Example: A newly divorced man suffers the following SP: 7 (divorce) + 3 (major changes in living conditions) + 2 (major change in eating habits) + 2 (change in residence) + 4 (major change in financial state) + 4 (close friend dies) + 2 (trouble with boss) + 1 (traffic violation ticket) + 2 (major change in working conditions at job) = 27. He makes a 00 - 99 roll and gets a 00, suffering a heart attack an hour after signing the divorce papers.

POSSESSION

This is a state, in which a Satanic spirit possesses a character's volition, rendering him an incarnation of wrathful lust. It should be stressed that because of the potential for psychological feedback, a GM must never force a PC to be Satanically possessed. A player must be given the option, and then must freely choose to allow the GM to engage in some kind of possession story-arc, which his character is victimised by. This is an invasion, so remember that a devil is not a player-character (even though player-characters may be close to being devils). NPCs, of course, may be possessed normally, perhaps even being sufficiently evil or sick as to choose to summon them, as decided by the GM. The point to be stressed here is, the element of free will. If a PC is threatened with true possession, such as if his character's mind is entered by a devil, the question is how much free will he, as the human possessed, retains.

In order to be potentially possessed, a person must have gone insane. This may be caused either by the possession attempt itself, or the possession attempt must take place in the context of a mind weakened by insanity (such as by psychotropic drugs, or great faith-testing trauma). The resultant insanity must not have induced either death or mindlessness in the character, or else the devil has nothing left to possess. Once the devil has entered, in whatever form, the character's odds of

being possessed, depend on his **Moral Fitness** skill alone. The odds of resisting, per day of a new attempt, are **9 plus his Moral Fitness SL**, minus the devil's **Potency** (**P**). If the character cannot find a quiet place to pray, meditate, or otherwise get his head together for the bulk of the attempt duration, subtract **2** from the base odds. If he is actually shocked somehow, rendering him **Frightened** at any time during the attempt duration, subtract **4** from the attempt (cumulative with being chronically distracted). Each attempt costs **1 Wpr**; and note that Wpr may not be regained while a character is engaged in a moral struggle. The GM should roll secretly on **3(6)**, attempting to roll equal to or less than his success odds in order to let him resist. Whether the character realises that he is winning his moral struggle or not, is the GM's call.

Demon Potency Example Table

Demon	Potency
Leviathan (John Carpenter's The Thing)	15
Son of Satan (Prince of Darkness)	12
Sutter Cane (In the Mouth of Madness)	10
Legion (Mark 5:9)	7
Devil (The Exorcist)	5
Columbine spirit (Doom)	3

If the roll succeeds by **10+**, the devil is rejected outright, and is gone from the mind.
If the roll succeeds by **7+**, the character resists the attempt outright, but the devil lurks somewhere in the cavernous recesses of the mind.
If the roll succeeds by **5 - 6**, the character resists the attempt over the next hour, and the devil lurks as above.
If the roll succeeds by **3 - 4**, the character resists the attempt over the next full day, and the devil lurks as above.
If the roll succeeds by **1 - 2**, the character resists the attempt over the next week, and the devil lurks as above.
If the roll succeeds by **0** (rolling exactly what he needed), the character succeeds over the next **(6)** months, unless something happens to lower his **Moral Fitness SL**, in which case treat it as a failure, below. And the devil lurks, as above.

If the roll fails by **1 - 2**, the devil either gains possession of the character over the next **(6)** months, else forfeits that chance to gain weak influence over him immediately (GM's choice), while lurking.
If the roll fails by **3 - 4**, the devil either gains possession of the character within a week, or forfeits that chance to gain moderate influence over him immediately, then lurks.
If the roll fails by **5 - 6**, again the process either takes a day, or the devil gains strong influence over the character.
If the roll fails by **7+**, the character is possessed outright.
If the roll fails by **10+**, the character goes into fits and dies.

Weak influence means that the devil causes the character to think and do things which are not true to his character. The fact that the devil entered his character in

the first place indicates that he does not know himself sufficiently well. If the character realises he is possessed, he becomes **Frightened** whenever in a stressful or inexplicable situation. The GM should not allow the character to distinguish between impulses originating from his real self and the devil within; instead, he will find that the universe simply acts differently – people are stupider, more vexing, things don't go right, police are incompetent, etc. The character responds to this as if he were the normal one, thus guiding him toward evil.

Moderate influence means that the devil tries to shove him over an impulsive edge, into committing murder, or some other act of depraved violence. The devil, suddenly acting, takes control of the character's body and emotions for a **number of half-seconds equal to 20 minus the character's WIL**. E.g. a character with WIL 13 would "not be himself" for 3 full seconds. The character perceives what he is doing, but the moral significance of the act is occluded. Aside from total possession, this is probably the most beguiling manifestation, because the character acts before he has time to reflect on what he is doing.

Strong influence means the devil controls the character's body to a substantial degree, but may be bound by certain idiosyncratic rules relating to the exact nature of the possession (adjudicated by the GM). The character is effectively **Dazed**, but if he realises he is possessed, he may spend **4 Wpr** to roll his **WIL or less** on **3(6)**, in order to take any simple action not directly related to countermanding what the devil is trying to make him do. In other words, the only way to act in even the simplest manner, is to trick the devil by either conjuring the impulse to do something, which the devil also wants to do, or doing something which the devil cannot find sense in, and therefore mistakes for some kind of insanity (which is the nature of the situation, after all!).

Total possession means the individual has gone **Mindless**, *after* the devil has taken him. Treat the person as being **Knocked Out** for the duration. This is actually disadvantageous to the devil, because although it now controls the person's body, it cannot torture the character at its pleasure, as by allowing him to scream, shout for help, etc. Thus, it cannot hide behind the person's mind to avoid tipping off potential exorcists.

Recognising a possession attempt in yourself is a **Theology** skill roll, with Base Odds of **0**, modified by **INT**. Recognising it by another person requires four hours of face to face investigation with the subject while he is awake, with Base Odds of **8 minus the given devil's Con/Acting SL** (averaging 10+); if the possessed person is totally possessed, add **4** to the Base Odds. Success also renders the character automatically **Frightened** for the remainder of the possession attempt. A character who is aware of such an attempt, can determine whether a devil is struggling for full possession, or merely flanking his soul through lesser influence, by making a **Perception** roll (modified by **Telepathic Sensitivity**), with Base Odds of **8 minus the devil's Con/Acting SL**. A possessed person realises he is possessed by spending **1 Wpr** and rolling **INT + 2 or less** on **3(6)**; he may try again whenever presented with compelling evidence.

Example: After being forced to ingest Liquid Satan, Calder (INT 9, WIL 17, Moral Fitness 7) attempts to recognise that he is being possessed, spending 1 Wpr. His odds are 8 - 1 (the Liquid's Con/Acting SL) + 7 = 0. He rolls a 5, realising he's in supernatural peril.

Calder's odds to resist are 9 + 7 (his SL) - 12 (Liquid's Potency) = 4. Calder rolls a 9. As the devil is on a schedule, it takes immediate strong possession of him, and he rises up from the wet office floor. He makes an INT roll, scoring a 3 and realising with horror that he is possessed. He spends 4 Wpr, trying to clutch a chair to stop himself from moving. The GM rules that the Liquid isn't terribly intelligent, and so mistakes this as an attempt to grasp a weapon. The chair banging on the risers behind him, Calder ascends the stairs toward his friends.

Slowly realising this isn't working, Calder struggles through his dread and confusion, spending another 4 Wpr to begin singing, hoping to forewarn his friends. As it happens, he is a fine Negro Spiritualist (Classical Singing 10) and the devil disregards this in bemused mockery. Hearing singing and banging, his friends gather at the top of the stairs, to find Calder, face drenched in sweat, pouring his soul into "Amazing Grace".

Standing at the top of the stairs, he realises that if he does nothing, he will murder his friends. Unable to warn them, he spends 4 Wpr and rips a flat wooden baluster from the nearby railing. The devil again thinks of this as a weapon. Smiling and laughing, as if at the insanity of it all, Calder spends his last 4 Wpr to kill the nearest innocent person by sticking the wooden knife through his own throat.

A possession remains until the person is killed or the devil is cast out in some manner. This requires the use of the **Exorcism** Skill. See below:

Exorcism: This is modified by Leadership, Teaching, and Telepathic Sensitivity characteristics. This is the special skill of detecting and casting out devils from tormented souls. It trades off to **Moral Fitness** at ¼. Each exorcism proper session takes four hours, and requires elaborate preparation, best left to the GM to detail, tailored to his specific campaign, and arbitrate the effectiveness of various methods, depending on the exact nature of the situation. For instance, a Catholic Rite of Exorcism probably wouldn't be able to exorcise the Liquid Satan, any more than it could exorcise LSD; in those cases, a biotic, and an abiotic contaminant is physically preventing the devil from loosening its grasp. However, performing such a rite might furnish the beset character with additional Wpr, in the form of added faith in his friends' confidence. Proper exorcism's Base Odds are **5 minus P**, where P is the **Potency** of the devil.

In a pinch, and provided both that the victim is not Mindless, and that the character's attention can be gained for sufficient time, an exorcist can try to reconnect with the humanity of the victim for long enough to avoid further calamity. In these cases, the attempt requires a few seconds or minutes -- use the **Command Time** rules, treating this as a single command. On a success, the devil is reduced to merely lurking for a minute, and whatever incapacitation state the victim is in is drawn out. The GM must decide whether and when the devil

attempts to regain control. Note that this may give the victim a chance to get to a proper place of sanctuary. An exigency exorcism's Base Odds are **12 - P**.

Example: In the midst of a high-school shooting massacre, a Professor (LDR 15, Moral Fitness SL 4), follows the strongly possessed Shooter into a dead-end classroom. The Shooter raises the rifle to shoot, but the Professor has a brainwave and attempts an on-the-spot exorcism, by pointing at his own face and saying "Look into my eyes!" to call his attention to the humanity of his rifle-target. His odds are base 12 + 1 (his effective Exorcism SL) + 1 (Leadership 15) - 3 (the devil's Potency) = 11. The professor rolls an 11, and the Shooter suddenly recognises Mr. Anderson, dropping the rifle and stumbling into a corner to curl up in a ball.

Welcome to the Unofficial Support Page for the Phoenix Command Combat System, originally published by Leading Edge Games. This site is a source of experimental rules, new weapons data, and vehicle data for the line of Phoenix Command Combat System Games.

The Revolution Continues...

WHAT'S NEW

WE'VE MOVED!

We're now settling into our new digs here at **phoenixcommand.com**, which has a bit more space than the old **motiondigital.com** site.

New to the page this time is the the **Sri Lanka** scenario pack and the **Siege of Yeltsin** scenario.

Also added is a **Sitemap** and a **FAQ Page**. These should make navigating the site a bit easier.

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PCCS Unofficial Support Page

Miniatures Rules

Rules

- Introduction and Definitions
- Basic Miniatures Rules
- Tables

Tables of Organization and Equipment -- Modern

- Modern Canadian Mechanized Infantry
- Modern North Korean People's Army Infantry
- Modern Spanish Mechanized Infantry
- Modern US Army Infantry
- Modern US Army Dismount Section
- Modern Russian Motor Rifles

Rules Expansions

- Integrated Morale Rules
- Attribute Modifications - by Fredrik Tegman
- Civilians in Combat
- Mob Actions and Riots

System Expansions

- Air Support Rules - by Eero Juhola
- Chemical and Biological Weapons Supplement

Small Arms Combat System Support Page

- WDS- Pistols

- WDS- Rifles
- WDS-PDW
- WDS- Shotguns
- WDS- MG
- WDS- AMR
- WDS- Explosive Weapons
- WDS- Exotics
- WDS- Anti-Tank

Mechanized Combat System Support Page

Modern Unit Organizations

- Canadian Infantry Platoon Organization
- North Korean People's Army Platoon Organization
- Modern Spanish Mechanized Infantry - by Juan Luis Perez Borrego
- Modern US Army Infantry
- Modern US Army Dismount Section

WWII Unit Organizations

- Waffen SS Panzer Grenadier Platoon Organization (1944-1945)
- Fallschirmjager Platoon Organization (1940-1945) by Panzerfaust
- Kurstenjager Team Organization (1943-1945) - by Panzerfaust
- Soviet 62nd Army Storm Group (1942-1943)
- French Armoured Infantry - by Panzerfaust

Modern Scenarios

- Red Embers Scenario Pack Russia
- Welcome to Hell Balkans (Yugoslavia and Romania)
- Things Fall Apart Liberia
- This Land is Our Land Canada
- A Long Time Before Peace Sri Lanka
- Seige of Yeltsin Russia

Roleplaying System Support Page

- RPG- Death of Nations
- RPG- Jericho
- RPG- Rules Expansions
  - Phoenix Command Character Generation System by William Miller
  - Phoenix Command Special Ops: by William Miller
  - Equipment List: by William Miller
  - Weapon Creation V.1.3: by William Miller
  - Optional Skill Rules by KC

Phoenix Command Miniatures Rules and Expansions

In recent years, I have been growing more interested in miniatures gaming, and **Phoenix Command** makes an outstanding set of rules for miniatures simulations. But it was the introduction of the **Terminator 2 Miniatures Game** that provided the spark to explore **Phoenix Command** from another direction. The miniatures rules developed for T2 gave the opportunity to explore rules designs for command and control rules, as well as morale rules.

This page will contain links to sub-pages on a Miniatures Gaming system for Phoenix Command. These rules are in an ongoing state of development, so I would greatly appreciate any and all feedback.

Presently, only the base rules have been uploaded. Rules expansions for vehicles, artillery and air support, and warfare through the ages are in the planning stages.

Phoenix Command Core Miniatures Rules:

- Introduction and Definitions
- Basic Miniatures Rules
- Tables

Tables of Organization and Equipment -- Modern

- Modern Canadian Mechanized Infantry
- Modern North Korean People's Army Infantry
- Modern Spanish Mechanized Infantry
- Modern US Army Infantry
- Modern US Army Dismount Section
- Modern Russian Motor Rifles

Phoenix Command Rules Upgrades

This page contains rules suggestions and rules upgrades for Phoenix Command.

Small Arms Combat System

Integrated Morale Rules - These rules add graduated morale effects on combat. Combatants progress through various stages from Bold to Cautious to Panicked, with each state having an effect on how well they engage in combat.

Attribute Modifications - Fredrik Tegman has provided these tables of modifiers to Recovery Rolls and ALM based upon character attributes.

Civilians in Combat - These rules allow referees to add an in the element of civilians on the battlefield, particularly in simulating low-intensity conflicts.

Mob Actions and Riots **-** Rules for simulating the action of riots. Contains rules that are suited for roleplaying and skirmishing.

System Expansions

Air Support Rules - Eero Juhola submitted these comprehensive Air Support Rules for use in PCSACS and PCMCS.

Chemical and Biological Weapons Supplement - CBW rules for use in PCSACS and PCMCS. Data is provided on all historical and modern chemical and biological weapons. The Biological Warfare rules can also be used for role-playing disease rules in **Living Steel**.

Send Comments

Page last modified: January 04, 2002

PHOENIX COMMAND

Small Arms

The Phoenix Command Small Arms Combat System revolutionized modern gaming by introducing a higher level of accuracy in small arms combat simulations than had ever been seen before, or since. For many who tried PCSACS, there could be no going back. This section of the website is dedicated to providing rules augmentations and new weapons data for PCSACS.

Weapon Data:

- **WDS: Pistols**
- **WDS: Rifles**
- **WDS: PDWs**
- **WDS: Shotguns**
- **WDS: MG**
- **WDS: AMR**
- **WDS: Explosive**
- **WDS: Exotics**
- **WDS: Anti-Tank**

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MECHANIZED SITE INDEX

Modern Unit Organizations

- **Canadian Infantry Platoon Organization**
- **North Korean People's Army Platoon Organization**
- **Modern Spanish Mechanized Infantry**
- **Modern US Army Infantry**
- **Modern US Army Dismount Section**

WWII Unit Organizations

- **Waffen SS Panzer Grenadier Platoon Organization (1944-1945)**
- **Fallschirmjager Platoon Organization (1940-1945)**
- **Kurstenjager Team Organization (1943-1945)**
- **Soviet 62nd Army Storm Group (1942-1943)**
- **French Armoured Infantry**
- British Infantry Platoon Organization (1945) (Coming Soon)

Modern Scenarios

- **Red Embers Scenario Pack** (Modern, Historical) A series of five scenarios for both PCSACS and PCMech on the conflicts that erupted in the former Soviet Union following the fall of Communism.
- **Welcome to Hell** (Modern, Historical) A collection of scenarios and background on the wars that tore through the Balkans following the collapse of the Soviet Union and Warsaw Pact. The scenarios are drawn from the War of Yugoslavian Dissolution and the Romanian Revolution.
- **Things Fall Apart** (Modern, Historical) Five scenarios for PCSACS set during the Liberian Civil War in 1990-91.
- **This Land is Our Land** (Modern, Historical) Scenarios exploring the different facets of Canada's Oka crisis of 1989.
- **A Long Time Before Peace** **(**Modern Historical) Four scenarios set in the Sri Lankan civil war of the late 1980's-1990's

Here are a set of links that deal with Wargames and Military Affairs. More links will be added over time, so check back here often.

Phoenix Command Websites

Legate's Aliens Page:
Legate's page has an extensive listing of weapons data, rules, and other support for LEG's ALIENS RPG. This is also the home page for the LEG web ring.

7.62mm: Tactical Military Gaming:
Run by PCCS List regular Eero Juhola, this PCCS website offers a collection of scenarios and weapon data, focusing on Finland.

Leading Edge Games Home Page
This website is an extensive compilation of information on Leading Edge Games products, and has a complete listing of all the quotes that appeared in LEG publications. Run by Brian Biswell.

The Phoenix Command Conspiracy
A Phoenix Command variant combining PCCS with Call of Cthulhu/Delta Green. Run by Jesper Anderson.

Gurth's Phoenix Command Page
Phoenix Command rules, expansions, and guidelines on weapon design. Run by Gurth.

Leading Edge Games - The Unofficial Home Page
Phoenix Command weapons data on modern weapons. Run by Greg Brovane.

Phoenix Command Mailing List
The Phoenix Command Mailing List is now run by William Barr through Yahoo's egroups. Click on the link above to join the list.

Phoenix Command Mailing List Archives
This website provides a searchable archive of the Phoenix Command Mailing List. Run by Akos M. Szderjei.

Miniatures Wargaming

Magweb: Military History and Gaming Magazines
Magweb is a subscription service that offers its members access to online editions of various military and wargames magazines. Several historically-oriented magazines are available through them.

Command Decision Mailing List
This is THE web resource for the popular Command Decision line of wargames, formerly published by GDW. Barry Geipel, who puts the page together, also manages an interenet mailing list for Command Decision.

Major General Tremordan Rederring's Colonial Wargames Page
A fascinating page devoted to miniatures wargaming with Colonial troops. Includes a wide array of images and links.

Horse and Musket Wargaming
This page provides source material for the Horse and Musket era of warfare (roughly 1750-1850), with a strong emphasis on Napoleonics.

Military Affairs:General

Welcome to Army Technology: The Website for the Army and Military Defence Industry
This is a website that has a lot of interesting technical data on current land forces hardware for the US Army and NATO forces as well. I have not gone all the way through this site, but what I have seen has impressed me.

Jane's Information Group Home Page
It's Jane's. Need I say more?

Stratfor.com
Stratfor is a world news service which provides news briefs and commentary on ongoing conflicts throughout the world.

Military Affairs: Canada and the United States

Armed forces: Canada
This is the official website for the Canadian Armed Forces.

Special Operations.Com
A page that deals with all manner of special operations forces issues. I've just had a brief look, but this page appears to have a lot of interesting articles on it.

The Age of Imperialism

A historical overview of some of the United States' "Little Wars" of the nineteenth century, including Central American interventions, the Boxer Rebellion, and the Panama Canal, among others. This site contains links to some interesting historical places on the web and is a good introduction to America's Empire.

Military Affairs: History

The Age of Imperialism

A historical overview of some of the United States' "Little Wars" of the nineteenth century, including Central American interventions, the Boxer Rebellion, and the Panama Canal, among others. This site contains links to some interesting historical places on the web and is a good introduction to America's Empire.

STEEL CHARIOTS

A page serving as a repository of information on historical Canadian Armor.

Elite Forces of the Third Reich

This site contains writeups on the special purpose forces and elite units used by the Third Reich in WWII.

Third Reich Factbook

This site contains a series of orders of battle and historical information on the Third Reich..

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Page last modified: January 04, 2002

Roleplaying with Phoenix Command

Although the rules technology was never really designed for the modern near-freeform style of roleplaying typified by games like White Wolf's **World of Darkness** series, or Atlas Games **Over The Edge**, **Phoenix Command** and **Living Steel** did bring a set of valuable design philosophies to the gaming table.

By pushing for realism, PCCS adopted a real sense of danger to player characters. Every decision became life or death, and roleplaying combat was reduced to an equation of survival. As the copy on the back of PCCS 1st Edition read:

> *"Using your current small arms combat system, place the muzzle of a large calibre pistol between your character's eyes. Squeeze the trigger. Continue squeezing the trigger until the character falls unconscious. Then, have a friend put a band-aid over that nasty .45 calibre dent in his skull and try not to get him shot too often in the week or two it takes to heal."*
>
> *"Now, using Phoenix Command, place the same pistol in the same place. Squeeze the trigger. You now have a choice: you can either roll up a new character or rush the body to a very sophisticated medical facility and discover the joys of role-playing a vegetable."*

This following links will take you to roleplaying resources for Phoenix Command. Check back on this page for updates.

RPG: Death of Nations
RPG: Jericho
RPG: Roleplaying Expansions

Send Comments
Page last modified: January 03, 2002

There are a number of recurring questions which I receive from time to time.

GAME RELATED QUESTIONS

Where can I buy Phoenix Command?

*Phoenix Command was published by **Leading Edge Games** until LEG ceased operations in 1996. This has made the products, especially the core Small Arms Combat System very difficult to find. There are three possible sources:*

a. *Used bookstores and used game stores. Phoenix Command may still be found in some game stores' inventories, and occasionally, caches of product are sometimes unearthed in distributor's warehouses.*
b. *Online retailers such as Amazon's Zshops sometimes carry Phoenix Command.*
c. *Online auctions such as ebay sometimes have Phoenix Command offered up for sale.*

How do I create my own weapons--where can I find the formulae? How are the weapon data derived?

The original formulae for deriving weapon data is the intellectual property of the game's designer, Barry Nakazono, and he has never released them to the public. Some formulae which approximate the weapons design process have been created, and can be found in on sites listed in our links section.

What is Phoenix Command?

Phoenix Command is a small arms combat simulation designed to be used with dice, paper, and/or miniatures. The Phoenix Command rules use a modular design which allows them to be inserted into any set of roleplaying game rules, or wargame rules. Rules exist for Small Arms, Mechanized (Tanks and Vehicles), Artillery, Hand-to-hand, Special Weapons, Roleplaying, and other aspects of warfare. Weapons data exists for many weapons, ranging from medieval to futuristic.

SITE RELATED QUESTIONS

Who designed all the stuff on this page?

The website design and any rules designs appearing here are created by myself, R.J. Andron unless otherwise stated. I tend to be quite careful in ensuring that proper credit is given and if a rules design, scenario, weapon design, or other design was submitted by another person, then I have placed that person's name atop the appropriate page.

Can you help me find gun parts, munitions, or fulfill other, bizarre requests that could have possible dangerous repercussions in the real world?

*Repeat after me...**Phoenix Command** is a game. I cannot help you find weapon parts, I do not deal in arms or munitions, and any unusual (i.e. dangerous) requests are typically forwarded to the proper authorities for further action.*

Send Comments

Page last modified: January 05, 2002

Roleplaying with Phoenix Command

Recently I rediscovered the following notes I had prepared for a **Phoenix Command Roleplaying Game** manuscript back in 1994. I thought that you might want to see my interpretation of what the PC:RPG might have been. Sadly, I never did any more work on the game as other projects would take up all of my time.

PHOENIX COMMAND
THE DEATH OF NATIONS

ROLE PLAYING ADVENTURE GAME

Introduction

Anno Domini 2060; Earth is dead...

Technological advances allowed humanity to reach for and capture a foothold in the stars. Though the promise of space was always tremendous natural resources capable of being exploited for the good of the Earth, there was always the danger, just as with the colonization of the Americas, that many people would rather leave the old order behind and strike out into the new frontier to build their own new nations.

Earth was worth abandoning. Its fragile ecosystem had been used up and crushed under the weight of ten billion people. Its nation-states were decaying as debt and economic collapse frayed and wore at the social fabric while resurgent tribalism sparked hundreds of tiny wars, each impossible to end. No one questioned the flood of would-be colonists eager to board any vessel that would get them off-planet, not when one considered what the colonists were willing to leave behind.

But there are the stirrings on the Earth; people are trying to rebuild their fragmented and decaying world. These are people who have run out of faith, out of hope, and out of options. They have to fight to reclaim the Earth from what it has become. For these few desperate visionaries, surrender and death ceased to be options years ago.

PHOENIX COMMAND: The Death of Nations Role Playing Game is a complete role-playing system including all the rules and background necessary to adventure in a game universe of space exploration and societal implosion in the year 2060.

In the **Death of Nations** setting, humanity has just started exploration of the stars. At the forefront of the exploration are a select few corporations taking tremendous risks in the

uncharted reaches of near space. The prizes are habitable worlds, each becoming a base for further explorations and granting its owners a wealth of chemical and biological treasures for exploitation. Humanity's home planet of Earth has been torn apart by war, economic collapse, and unbridled technology. As corporate prestige grows through space exploration, the prestige of nations wanes. Conflict between the two is inevitable.

The time of nations is passing. A new order must assert itself.

Welcome to **PHOENIX COMMAND: The Death of Nations**.

About the Book

The rules and setting are divided into four parts and several chapters, each of which is further divided into sections. This makes it easy for players to find specific rules when necessary. The tables used when playing the game are presented in the text. For ease of reference, the most important tables are also repeated at the back of the book and are numbered; the number also appears in parentheses whenever the table is referred to in the text.

At least three six-sided dice and one or more ten-sided dice (available in game and hobby stores) are needed for play. The ten-sided die is usually used to generate numbers from 0 to 99. To do this, roll the die twice; the first roll is the tens digit while the second roll represents the ones. So a roll of 6 and 2 would be 62, and a roll of 4 and 9 would be 49.

About the Game

Phoenix Command: Death of Nations is a Roleplaying Game which is part of the **Living Steel** storyline, and is set 300 years before the desperate last stand of humanity on Rhand in the onslaught of the Spectral invasion, and 100 years before the time of the Seven Worlds rebellion against the Imperium and the invading Dragoncrest Empire. **Death of Nations** is the prequel to the future histories described in **Living Steel** and **Dragonstar Rising**.

Death of Nations tells the story of a future history that would become known as the Corporate Wars. The Corporate Wars served as the foundation for the Imperium that would ultimately enslave Humanity under an oppressive caste system in the **Living Steel** and **Dragonstar Rising** settings. In **Death of Nations**, the Corporations are trying to establish themselves as the new political rulers of the human race.

However, **Death of Nations** continues the theme of other games in the **Living Steel** storyline. This theme is that the Dream of the Human Soul, while being crushed and stamped out throughout history, can never truly be eliminated. Every place that it is crushed by tyranny, it rises anew in another place, stepping out of its own ashes like the Phoenix of ancient myths. And the struggle continues.

Nations may die, but the Dream will always continue.

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DESIGNER NOTES: EYES ONLY

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Page last modified: January 04, 2002

RPG: Jericho

NOTES:

This is really the first major variation from the overall theme of the Phoenix Command Unofficial Support Page, and many of you may be wondering what this is all about.

Well, in late 1994 to early 1995, I ran a cyberpunk-style game using Phoenix Command roleplaying rules in the Lawnmower Man RPG (aka PC-Lite) and set the game in my own interpretation of the First Corporate Wars. The game was called Jericho, since it was to be set in a time when the very walls of society seemed to be crashing down. Besides, it seemed like a cool name at the time.

The game itself was a blast with a convoluted storyline that involved riots, mercenaries, biotechnology, and high-level politics. This was the last serious roleplaying game that the group played as time schedules forced us all to move on with our lives.

I recently rediscovered my notes and materials on the Jericho game, and decided to post them onto the internet in this form. These are unedited from their original text, even though in some places, I did think pretty hard about it--read the predictions in the worldview section and see how close I came to reality--or not, as the case may be. Anyhow, Jericho had--still has a lot of stuff I find interesting and I may as well share it with you. If you can find some way to use this in your own personal roleplaying sessions, I wish you well. Incidentally, these materials may not make it clear, but the original intent of the game was to have the players take on the roles of the disenfranchised revolutionaries--those who would still fight for the human destiny and the human spirit. In the Living Steel storyline, they would have been among the first to have fought for "The Dream."--essentially becoming the precursors to the Seven Legions.

Also, an interesting side note: At about the same time, Barry Nakazono and Dave McKenzie of LEG had let slip that they planned a Phoenix Command roleplaying game, and that the game was to be set in the first corporate wars era. Alas, this was not to be, since LEG decided to stop operations shortly after releasing the Terminator 2 miniatures game rules.

I won't claim that Jericho is anywhere near on par with what was intended for the official Phoenix Command RPG, but it is an interesting look at "what might have been."

Enough retrospection. Enjoy the Revolution.

RPG: Jericho Worldview

RPG: Jericho Worldview

WORLDVIEW:

The year is 2060, and the world is dying. Technology promised a golden age, but instead has ushered in chaos.

Technological advances allowed humanity to reach for and capture a foothold in the stars. Though the promise of space was always tremendous natural resources capable of being exploited for the good of the Earth, there was always the danger, just as with the colonization of the Americas, that many people would rather leave the old order behind and strike out into the new frontier to build their own new nations.

Earth is worth abandoning. Its fragile ecosystem has been used up and crushed under the weight of ten billion people. Its nation-states are decaying as debt and economic collapse fray the social fabric while resurgent tribalism sparks hundreds of tiny wars, each impossible to end. No one questions the flood of would-be colonists eager to board any vessel that can get them off-planet, not when one considers what the colonists are leaving behind.

But there are the stirrings on the Earth; people are trying to rebuild their fragmented and decaying world. These are people who have run out of faith, out of hope, and out of options. They have to fight to reclaim the Earth from what it has become. They have to fight for the Dream. For these few desperate visionaries, surrender and death ceased to be options years ago.

This is the time of Jericho, and the walls are caving in.

CHRONOLOGY:

The world has been sliding on a downward spiral into chaos for many decades.

The Iron Years: In 1996, the Second American depression began with the American debt default. Trillions of dollars worth of debt were defaulted upon by individuals, businesses, and even governments. The final blow which drove the economy into depression was the attempted financing of Federal debt obligations through the printing of new money. Within moments of the Presidential order being signed, foreign investors began selling off their debt and equity holdings, forcing a run on the markets rivalling the one in 1929. America, for all intents and purposes, was broke.

Following the 1996 elections, the new President tried desperately to keep the industries

working to no avail, but the American debt default had sent shockwaves through the international economy. Japanese banks collapsed like cards as Pacific Rim nations defaulted, forcing Japan to grind to a halt. German and French economies, overwhelmed by Eastern European refugees also staggered and fell. Britain kept going, oblivious to the economic calamity, but it had been in a depression since the end of WWII. The Canadian, Argentinian, Mexican, and Italian economies simply collapsed.

Tribalism: In Russia, Zhirinovskiy staged a coup that deposed Yeltsin and swept away the reformers. A reign of terror began as the Russian and international media are shut down. Rumors of purges to rival Stalin were heard, and by the turn of the millennium, a revitalized Russian army swept into the Baltics and part of Poland, almost triggering WWIII. Only French and German intervention prevented Russian expansionism from drawing all of Europe into a devasting conflict. The brief war for Polish soil gave Eastern Europe and the Franco-German coalition a small economic boost.

In the Middle East, a newly revitalized Iraqi army struck deep into Saudi Arabia, while the Iranians tried to expand northwards into Armenia and Azerbaijan. Syria and Turkey came to blows over water in the Euphrates River. By 2005, the Middle East was a cauldron of little wars. Even Egypt and Israel, two former longtime partners in peace engaged in border skirmishes and brinksmanship as Islamic Mujihaddeen struck across the border.

Other wars included:

- The massacre of Bosnians and Albanians in Greater Serbia,
- The resurgence of the Khmer Rouge in Kampuchea and Laos,
- Drug wars in Colombia, Venezuela, and Peru,
- The massacre of Christians and Kurds in Turkey and Iraq,
- The bloody fighting between ex-Soviet nationalities including Iranians/Armenians/Azeris, Russians/Ossettians, Russians/Georgians, Russians/Moldovans/Dniestrians, Uzbeks/Muslims, Afghans/Tadzhiks, Russians/Ukrainians, and on in terminum,
- Sudanese Muslim massacres of Sudanese Christians,
- Vietnamese massacre of Hmong,
- Guatemalan Confederacy massacre of Mayan and Incans

and so forth across almost every continent in the World.

In America during this period, the debt default had been accompanied by a renewed isolationism that kept America tightly focussed on itself. High tariff barriers put in place to keep foreign competition out only created an intense smuggling enterprise.

For those who could afford it, the "Fifth Migration"--the abandonment of the cities--gave the rich a way to protect their lifestyle. By moving to exclusive and private resource communities, the wealthy professionals were used telecommuting technology to build their own utopias. These resort communities were strongly protected by PSO forces to ensure that "undesireables" were kept out.

The abandoned cities and suburbs became nightmares. No one who could avoid the cities wanted to live there. In the suburbs, two-thirds of homes were vacant. These homes, often vandalized, served as shelter for squatters and vagrants. Municipal governments, among the first of the debt defaulters, were unable to fund infrastructure upgrading and public services.

Parks turned into garbage dumps because garbage collection was only funded for once a month. Public police services, where not contracted out to PSOs, was limited to wealthy neighborhoods and important downtown facilities.

Following the nationwide Blood/Crip war of 2024, the municipal police gave up all hope of trying to protect their communities, and settled for protecting themselves. It was into this environment that the NatGuard forces were summoned to try to maintain some order. In bloody fighting, the NatGuard took back the cities from the Bloods and the Crips, often block by block. For two years, American cities were truly war zones.

Even the Police and NatGuard were unable to prevent the waves of Islamic Terrorism which washed across American cities as Islamic fundamentalists, supporting one side or the other in the various Middle Eastern wars, struck at America. These terrorists inspired others, from Drug lords to environmentalists, to take up the terrorist methodology.

By 2030, the world was a collection of brushfire wars, and was still strongly in the grip of the deepest depression in modern history. The American economy was beginning to show signs of life, however, until a corporation called Heisson Aeronautics would dash those hopes.

INTO SPACE:

In 2033, Heisson Aeronautics made a public offering that was essentially unnoticed except for a few secretive investors. Heisson, a high-technology company which had been heavily involved in Space development and testing, was working on a private space project that they kept under the tightest of security. Whispers echoed through the aerospace industry about a project code named: Regalia.

When finally revealed in 2035, "Regalia" was a new form of physics, and a working prototype Gravitic Effects Drive (GED), which used gravitational forces for starcraft acceleration. Many companies, expecting a boom in space, invested heavily in the new technology, and Heisson Aeronautics stock skyrocketed in value.

These starfaring corporations were rewarded for their risks. The mining potentials of Luna and the Asteroids alone were worth enough to repay the investments in GED several times over. The economy began to improve across the world.

The net revenues from space travel gave the spacefaring corporations a tremendous financial resource, and made them much more self-sufficient. A stream of mergers and acquisitions followed as each spacefaring corporation began acquiring and amalgamating subcontractors until most corporations were able to supply themselves from their own divisions. The corporations owned their own communities, sold their employees goods from company stores, and taught their children in private company academies. StarReach, Kansas, was the first of these planned corporate communities, and it was completely isolated from the rest of the world. Only employees of Startech could enter StarReach.

Ten years later, Heisson Aeronautics unveiled yet another Regalia technology--the Heisson Drive. By using the same physics as the Regalia project, Heisson Aeronautics had developed an interstellar stardrive that opened new solar systems to exploitation by the spacefaring corporations.

Within a few years, New Eden, the first corporate colony world was discovered. It was a hot

dirtball, with subterranean water and a noxious atmosphere, but it was capable of supporting human life and had the potential to be terraformed into something better. The owning corporation's stocks shot upwards, and new investment and licensing offers poured in.

Seven other colony worlds were located, as well as dozens of other "resource" worlds that were developed for mining. As each new colonizable planet was located, the owning corporation was able to reap the profits.

Many people saw the colonization of space as the salvation of humanity. The human race would continue, but not on the polluted decaying Earth. It was so much easier to colonize a new world than to try to repair the homeworld.

THE TIME OF JERICHO

The preceding chronology provides much of the megapolitical background and trends up to the time of Jericho and shows the world in a fragile state. The people of Earth are divided now along tribal lines, economic lines, and poliitical lines, and this is accompanied by a sense of abandonment by the human elite. There is also the sense of desperation in everyone. People are afraid to live on Earth, and are afraid of being left behind.

There is war coming, and people are choosing sides...

Tribalism: One of the driving forces behind current events is the resurgence of tribalism that manifested itself in the "Iron Years" following the debt defaults. During that time, people sought comfort within groups, using the commonality of the group to combat the personal impacts of the economic and political chaos of the era. The development of street gangs in the 1940s and 1950s was a similar pattern, but on a microscopic scale.

One of the most prominent "tribes" were Islamic fundamentalists, who banded together out of religion and used their group to wage war against their enemies. Street gangs also formed prominent tribes, often based on race or economics.

Ultimately, the tribal concept has taken over the western world. People identify themselves by their group. The good of the group is more important than the good of the member, and anyone not a member of your group is a potential enemy.

The divisions between tribes and groups were so significant that many new languages developed. Called "Ghettospeak" by the political analysts, these languages presented significant barriers to education and integration, not only because of the actual linguistic barrier, but also because many of the languages did not contain common concepts. For example, Ghettospeak dialects are grounded in the present, with no concept of future tense, which makes the understanding of key scientific ideas almost impossible.

Years of racial and economic stagnation have pulled the people into several distinct socio economic clans. People identify themselves according to these groups, claiming the security and sense of existence offered by the group. To many, not belonging to a group is the equal of being dead.

A century after King, and the nation is more divided than ever.

Economics: With the development of space travel, the gap between rich and poor widened into a gaping chasm. For the elite, the promise of space was a new golden age of prosperity and order for humanity. For the poor, space was a death sentence.

Following the Fifth migration, the rich and poor were physically separated, with the rich living in secluded resort towns and leaving the cities and suburbs to the poor. Those who have been abandoned to the cities face much the same problems as their parents did years before, in the time before the Blood/Crip wars.

Cities remain the centres for planetary manufacturing, with the manufacturing workers living in the suburbs and in apartment complexes near the industrial facilities. The manufacturing facilities are aging and are unable to compete with the unique capabilities of zero-gravity processes. As a result, Earthbound corporations are forced to restrict their production to inexpensive, lower-technology goods for sale to the poor and middle-class. While the technology in these goods is highly advanced by twentieth-century standards, it is nothing compared with the technology available to the elites.

Many homes and buildings are half a century old or older, reflecting the shift in the construction industry to serving the resort communities. Any new buildings are typically of poor or prefab workmanship, designed to accomodate local workers.

The city economy remains vibrant, despite all the foregoing. People remain consumers, and street merchants ply their wares in city squares and corners. Shopping malls are little more than collections of these street merchants in a warehouse-type enclosure protected by cyclone fence and metal detectors at the gates. PSO operatives watch over the entire affair, protecting their contracts.

But there remains the dark side. Many suburban communities are ghost towns filled with abandoned buildings owned by bankrupt mortgage companies. Street gangs rule the nights, selling designer drugs and homebrew weapons to their victims. Bitter wars are fought over turf by these young tribes. Squatters hide in the abandoned homes, and maintain a precarious existence at the bottom of the food chain, as their children become the next generation of gangsters.

For these people, the only road to prosperity also leads to a quick death. OG's don't live past 25.

Politics: Space travel has also created massive divisions in politics as the corporations seek to free themselves of governments. National governments, however, see their power slipping away, and are trying hard to maintain some of their power, but the citizenry, alienated and disempowered, could care less about this grand scale of politics.

America stopped any pretense of being a democracy following the Blood/Crip war, when NatGuard troops fought to recapture the cities from the criminal gangs. At that time, civil liberties were suspended, and the government took the opportunity to round up dissidents and malcontents and place them into MaxSec Detents, along with surviving gang members,

National politics are still based on the Democratic/Republican dichotomy, with the parties switching Presidents every two terms. The current President is Democrat Michael Prestanki, who was elected on a platform of developing a national technology base for all citizens. He was elected by 7% of the eligible voters.

The media are still relatively free, but the underground media often give the best stories, though loaded with political bias. Corp media care only about entertainment, not the truth, leading to Information Programming, rather than news. There are rumors that the undergrounders get their funding from Corps or governments, depending on their political bent.

The military has assumed a more significant role in national politics, simply because of their new law-enforcement role following the repeal of the Posse Comitatus Act in 2032. The military now perform border-watch duties and patrols of Urban Security Zones (peacekeeping), as well as smuggling interdiction and a number of other duties. It is not uncommon to see Army vehicles on city streets. But even so, the military is finding recruitment tough, since they lose many of their troops to corporate Striker teams (Corporate Security), which offer better benefits and less risk. Other troops turn to mercenary careers, either for crime or foreign governments.

On the opposite end of political power are the dissidents, which range from Corporations, to tribal leaders, seeking to advance their own causes. There are also the apathetic majority, fighting only to survive at a modest standard of living.

At the very bottom of the political food chain are the disenfranchised--the poor, the homeless, and the dissidents. They are shunned, but their numbers are growing.

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Page last modified: August 27, 2000

RPG: Roleplaying Expansions

This page contains rules that expand on roleplaying with Phoenix Command.

William Miller has provided the following set of resources for rolpelaying in PCCS. These are zipped files, and require Adobe Acrobat viewer to read.

Phoenix Command Character Generation System: This PDF file provides basic rules for Roleplaying Character creation

Phoenix Command Special Ops: A PDF file containing guidelines for creating Phoenix Command Characters in for Special Operations roleplaying.

Equipment List: Modern-era equipment in PDF form.

Weapon Creation V.1.3: This Microsoft Excel spreadsheet uses a comparative approach to generate gun data for Phoenix Command.

KC has submitted the following rules and rules modifications for roleplaying.

Optional Skill Rules: Skill contests, skill deterioration and upkeep.

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Page last modified: January 03, 2002

Raw Ability Contests

Certain limited-outcome contests (e.g lifting a heavy object, staring matches), or contests in which raw ability appears to matter as much or more than skill (e.g. armwrestling, grabbing a door before it closes), aren't well simulated by the A/R system.

Two agents: Roll 3(6) against the relevant characteristic(s), determining the success or failure degree, which are then compared. If more than one characteristic applies, determine which is secondary, and add ½ of it to the primary. Similarly, if a skill applies, add ½ of it to the primary characteristic.

> **Example 1**: Duke (STR 18, Armwrestling 5) and Bitch (STR 16, Armwrestling 8) decide to armwrestle over mating privileges (i.e. who's on top). The GM rules success by 4+ is required to win. Duke totals 20, rolls 7, for a success of 13. Bitch totals 20, rolls 10, for a success of 10, nearly capitulating. The GM calls for Will rolls. Duke (Will 16) rolls 15, while Bitch (Will 15) rolls 10 and pins Duke's hand to the table-top with a grin on her face.
>
> **Example 2:** Frasier (WIL 12, Meditation 2) and Eddie (WIL 14, Meditation 4) get into a staring contest. Frasier totals 13 and rolls 10, succeeding by 3; while Eddie totals 16 and rolls an 8, succeeding by 8. Foiled again!
>
> **Example 3:** Bradley (HLT 17, WIL 14, Marathon Running 16) and Katherine (HLT 17, WIL 15, Marathon Running 18), enter the Boston Marathon, and slowly whittle the competition down to each other. Health is primary here, modified by willpower and skill. Bradley's HLT+0.5 x (WIL+SL) totals 32, and he rolls an 11, succeeding by 21. Katherine totals 34 and rolls a 7,succeeding by 27 and breaking the ribbon first.

One agent. The GM rules at what characteristic level it would be easy to accomplish the task. The amount this number exceeds 16 equals the negative modifier applied, or conversely the amount this number is less than 16 equals the positive modifier applied. A task roll on 3(6) is then rolled as normal against the raw characteristic. If a skill applies, add ½ of it to the characteristic.

Example 1: Reggie (STR 14, Weightlifting 6) wants to pick up a huge chunk of die-cast steel chassis off the concrete floor of the machine shop. The GM's not interested in determining exactly how many pounds Reggie can lift, nor precisely how heavy the chassis is, but rather rules that it would be easy for STR 19 to pick it up, yielding a -3 penalty for anyone to attempt it, D = 1 Phase (see State Decay, below). STR 14 + 3 (½ Weightlifting SL) -3 = 14. Reggie rolls a 13 and straining, hurries it over onto the skid 10' away (3AC) before shay drops it.

State Decay

Often the results of a successful skill roll will be temporary at best, such as when one is attempting to carry many objects without a proper container, trying to keep the attention of a crowd, or using a forklift to stop a load of wood from collapsing . The amount succeeded by equals the state level achieved. The GM must assign the state decay rate D a value in time (Phases, Turns, minutes, hours, days, weeks, months, years, etc) accounting for the factors involved in its durability. State level x D = time to decay. Once state level reaches 0, the system immediately begins failing, with total failure happening in ½ x D. A negative state level indicates immediate total failure.

LIFTING ENDURANCE TABLE

STR differential	D	Standard Time
-8 to -13	1 Impulse	½ second
-3 to -7	1 Phase	2 seconds
-2 to +2	1 Turn	8 seconds
+3 to +7	15 Phases	30 seconds
+8 to +13	30 Phases	1 minute

For weightlifting purposes, a character may transfer points to STR temporarily, deducting them from the STR differential, and risking injury. The amount the original STR attempt was missed by indicates the injury sustained. A character can, if given adequate time, simply keep on aborting attempts until the first die comes up a 1, thus, only in crises is lifting weights particularly difficult. Also, note how in Example 1 below, the problem is one of applying strength, while in Examples 2 and 3, the problem is one of applying agility to something one can already lift.

Example 1: Crackhead Bob (STR 11, Weightlifting 2) tries to lift an awkward 27" television set. The GM rules this is a STR feat at -2, D = 1 Phase. Shay rolls a 10, missing by 1. Bob (-7 away from the easy STR of 18) transfers 6 points to his STR, increasing it to 17 for a 7 point success, while also downgrading D to 1 Impulse. Bob can carry the tv for 7 Impulses, his back groaning, but manages to move the set without injury.

Example 2: Killborn (AGI 9, Handwork 2) tries to pick up a pile of books, papers, a scarf and pair of mittens simultaneously from a counter, running with them to catch a bus a block away. The GM rules this is an Agility feat at -2, modified by Handwork, D = 1 minute. Killborn rolls a 5, 2, and 1, totalling 8,

and manages to get 1 Hex before dropping a book in the revolving doors.

Example 3: Stacy (STR 10, AGI 10, HTH Combat 1, Handwork 1) grabs at her son Pete falling over the balcony railing. The GM rules this would be easy for Agility 18 (-2), modified by Handworking or any melee skill, D = 1 Turn (it would be easy for STR 12 to lift Pete). Stacy needs a (10 - 2 + 1 =) 9 or less, and rolls a 9! She snatches Pete's flailing fingers in a weak, sliding grip, with only two Phases to spare!

A character may try to increase the state level by making a second task roll. Failure reduces the state level by the difference failed by. A negative state level indicates immediate total failure.

Example 1: Killborn tries to grab the book and get a better grip on everything. The GM rules this is an Agility feat at -4 (-2 basic mod, -1 collapsing system, -1 for being in revolving door), modified by Handwork, D = 1 minute. Needing a 6 or less, Killborn rolls an 11, dropping everything in a flurry.

Example 2: "Don't let go!" Pete (AGI 10) cries, trying to get a grip on his mother's hand, which the GM rules is an Agility feat, modified by Handworking or any melee skill. She rolls a 12 and fails. Stacy tries to improve her grip, needing a 9 or less once more, and rolling a 14. Pete falls from their six-story (50') balcony to the greensward below, screaming and rolling Fall Recovery 22 - feet/2 + SL1 = 22 - 25 + 1 = target -2. Pete rolls 12, failing by 14 points, and ends up in the hospital with 210 PD and an 82% chance of survival.

Cooperation

The GM may rule that two or more characters may cooperate with each other to perform a single task, such as making a quilt, forging documents, writing a screenplay, bearing a heavy coffin, or team-fighting in the Battle Circle. The Living Steel core rule book recommends that in a team effort, the highest SL present is the one used. For aggregate efforts which seek to cut time, each character makes his own success roll, with any failure botching either the entire effort, or his fraction of work alone, at the GM's discretion. Alternately:

Aggregate effort (Multiple die rolls, average success level). When each character is responsible for an individual section of a patchwork project, each character makes a separate skill roll. The average of all successes indicates the overall quality of the project; deduct the worst failure from this average. Sections fail according to the individual dice rolls.

Example 1: Nell, Jane, Myrtle, Felicity, and Twee, with Sewing SL 13, 10, 13, 7, and 5 respectively, meet to teach, learn, laugh, and make their entry for the annual County Quilting Championship. The GM rules that it would be easy for SL 8 to make a decent section. They roll 14, 10, 9, 7, and 16, succeeding by 7, 8, 11, 8, and -3 respectively. Twee's section is badly done and the others realize it was a mistake to induct him before the championship. On the morning of the judging Nell hastily reworks it against a target of 8 - 3 (previous

failure) - 2 (pressed for time) = 3 + SL 13 = 16 or less, rolling a 7, succeeding by 9 to make it one of the best pieces. The group average shifts from 6 to 9.

Seamless effort (Single modified die roll). When each character is contributing to the success of a single task, only one die roll is made, by the most skilled character. The GM first determines the maximum number of contributors, beyond which penalties are incurred rather than bonuses. Then, start with the highest SL. If the second-highest SL is greater than ½ the highest SL, add 1. If the second-highest SL is ½ or less, there is no modifier - however, then compare the second and third-highest SLs in the same way to determine if the second-highest SL is increased by 1 (which might then affect the highest).

Example 1: Three junior detectives (SL 2, 3, and 6), are trying to outwit a professional antique thief (SL 8). Since SL 2 is greater than half of SL 3, SL 3 boosts to 4, which is now greater than half of SL 6, which in turn boosts to 7. Thus, the detectives' seamless effective SL is 7.

Interactive (Multiple modified die rolls). For raw ability contests (single) combine characteristics for purposes of determining D. Failure is applied to the Lifting Endurance Table from the lowest range, to downgrade D (e.g. failing by 6 when D = 15 Phases, would result in D equalling 1 Phase), but so long as anyone succeeds, their success level is used by all.

Example 1: With the forklift busy and needing to move the same chassis chunk again onto a pickup truck bed 15' away, Reggie (STR 14, Weightlifting 6) gets Brent (STR 12, Weightlifting 2) to help. Once again, the chunk is STR 19 to easily lift (-3). Their combined STR of 26 ensures D = 15 Phases. Reggie's target equals 13 + 3 (Weightlifting 6) - 3 (chassis weight) = 13 or less; Brent's target equals 12 + 1 (Weightlifting 2) -3 (chassis weight)= 10or less. Reggie rolls 7 on 3(6), succeeding by 7 x D = 3½ minutes; but Brent rolls 16, failing by 6, changing D to 1 Phase x Reggie's success level of 7 = Brent drops it in 7 Phases. "Hurry!" Brent barks. Luckily the truck bed is only 5AC away + 4AC to set it down. No problem!

For skill contests in which people are trained to work together, use the rules given for B (Seamless effort) above, but each character rolls his own dice, and each gains the modifier. Additionally, an opponent will lose the modifier.

Example 2: A pit fighter (SL 6) faces two opponents (SL 2, 3) trained in tandem-fighting. Thus, when attacking together, the pair fight at SL 3, and 4 respectively, while the pit fighter fights at SL 5. He'll probably win, but not easily.

Experience

Beyond the incidental experience points, award the PC's each (6) Learning Points each at the end of each scenario, or 2(6) for good roleplaying, to be spent on improving any skill(s) even remotely applicable. Maximum SL increase 1 per session. Improving Fields costs

double. XP may be exchanged for Karma Points at a rate of 1 per 0.1. Karma may also be awarded for roleplaying a character's True Will [as per Living Steel section 7.8].

Extended medical example: While patrolling in a jeep with the physician Stiles, the camp dog Cedilla gets badly wounded by a weird antipersonnel weapon, and the jeep crashes. The skill tradeoff ratio for human to veterinary medicine is ½, so Stiles effectively knows Veterinary Medical Aid SL 5. Administering first aid is easy for SL 4 = base 12, -2 for weird weaponry, +5 SL = 15 or less. Stiles rolls a 16 and can't stabilize Cedilla, who's obviously dying. He pauses for ten seconds, wrestling with conscience, then produces an hypodermic syringe and injects the dog with Oxyspan, creating a window for surgery, and reducing the patient's Health by 2 (HLT 15 - 1(6)), equalling 13, with a critical time period of two hours. With the jeep wrecked, Stiles must carry the inert dog on foot back to base...

Back at the base, Orlando sizes up the patient's condition. Diagnosing severity of injury is easy for SL 10 = base 6 - 2 for weird weaponry, equals 4 + 7 SL = 11 or less. Orlando rolls an 11 and estimates Cedilla has a 3000 PD wound, with now less than ten minutes to live.

Orlando is picked to operate because he has the highest skill (Medical Aid 13) and because he already knows canine first aid (SL 2), and so can round fractions up, yielding de facto Veterinary Medical Aid SL 7. With no time to spare, Stiles is left to tend the diagnostic machine (see example above) whilst Orlando operates in the deserted medical theatre. Operating in a Trauma Centre is easy for SL 8 = base 8, -2 for weird weaponry, -2 for under-staffing, +2 for machine diagnosis, +7 SL = 13 or less. The surgeon rolls a 10, and skillfully sews the dog back together after extracting nearly all of the elaborate shrapnel.

Three weeks later Cedilla makes her recovery roll on 0-99. With 3000 PD and Health 15, she needs a 64 or less, and rolls a 16, steadily gaining strength. In another two months she'll be completely recovered, albeit with terrible scars and a permanent reduction in running speed.

Skill Oxidation

Aside from loss of raw talent due to age loss and injury, skills neglected will get rusty with time. For every three months a skill is not used either in a crisis or on the job, deduct 1 Learning Point from its total, reducing effective skill levels as applicable. The highest LPT ever achieved for a given skill is recorded, as for the purposes of refresher courses, characters re-learn their skills at ten times the normal rate, up to the LPT from which they started getting rusty. LP gained beyond that watermark are earned at normal rates.

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RPG: Jericho Technology

TECHNOLOGY:

More than anything else, technology is the ultimate prize. It is the contemporary Grail.

Corporations are engaged in a desperate scramble for new technology, realizing that new technology is the key to prosperity and power in the new society. Corporate espionage and sabotage is all geared towards gaining or keeping a technological edge over the competition.

This section describes some advances in technology in specific areas so that players have some idea of the cutting edge (as the public perceives it). At the end of this section are several examples of contemporary technology.

Computers and Communications: Given the explosive advances of data technology in the late twentieth century, it is difficult to imagine the computer/communications technology of 2060. In a sense, computers have continued to grow faster and more powerful, with terms like 2 megabit bandwidth databuses, 20GHz processors, multi-Terabyte chips, and Random Instruction Processor Protocol (RIPPers) being commonly bandied about at the consumer level. But computer technology has hit the wall of human capability. Humans simply don't need that much computational power, and the software has fattened up to compensate.

In human terms, computers can provide holographic imaging, voice recognition, multitasking, mathematic-dimensional sound with full emulation capabilities. Perhaps the best way of giving an idea of the technology is by showing that the average dataterminal has media access (television, vidphone, telecopier) as its primary role--effectively replacing all the old media access technologies.

Telecommunications have likewise kept pace with data technology. Telecommunications come in either landline (fibre-optic cable) or broadcast (microwave burst) and both are used extensively. Every city has a cellular digital microwave network supplementing an extensive fibre-optic grid, though only the microwave network can reach into the gang-ruled neighborhoods of the downtown and suburbs.

All communication is routed through the planetwide DataNet, a form of global information highway. This net allows full video (often holographic) transmission to anywhere on Earth, and there are gateways to Graviton Pulse Communicators, permitting FTL communications with the colonies.

Rumors of new technology include organic processors, instant linguistic translation, and

holographic memory storage.

Genetics: The Information Revolution has been most felt in the genetics field, where genetics has finally entered the consumer field. Only the rich can afford genetic products, like Turf (R) brand lawnseed (never needs mowing), or genetically pure fruits and vegetables. This is the consumer side of genetics. Not seen as much are the genetic immunization drugs, which have already wiped out dozens of diseases. Even less seen are genetic vivisections, and human testing is rumored to be occurring on some of the secret corporate worlds. Genetic weapons are a persistent concern.

Vehicles: Vehicles are all based upon either an alcohol-burning turbine, or a capacitance gel battery. Both have similar performance, and both use a renewable and relatively clean power source. Gravitic Effects Drive has, however, created a new class of vehicle--contragravitics. These range from carryall dropships for orbit-to-ground transfer to heavily armed and armored gunships.

TECHNOLOGY SAMPLER:

Finance

Currency Cards: Originally designed as a form of bearer security, currency cards have become almost a replacement for currency. Currency Cards look much like credit cards but are issued in set denominations of 20, 50, 100, 1000, and 5000 Cr. The back of the card has an optical strip, which will authorize payment from the issuing institution up to the denomination amount. On the face of the card is a Liquid Crystal strip which shows the value remaining on the card, and once the strip is spent, the card reader keeps the card for recycling by the issuer.

Electronic Fund Transfer Authorization Card: EFTA cards are used for special fund transfers between large corporations and investors. The EFTA card looks very much like a standard credit card but does not possess the twin optical strips. Instead, all EFTA data is burned into a set of PROM chips. At a special termina, often found only at large financial institutions, the PROM chips can be interrogated for security codes and countercodes. If these are acceptable, the PROM chips then provide the interrogator computer with the amount to be transferred, the appropriate account numbers, the date range in which the transaction is to be effective, and recognition and identification criteria of the parties involved. Once the information has been read and approved by the reader computer, the security countercodes are wiped from the EFTA chips, making the card useless for fiuture transactions. Because of their ease of use and security, EFTA cards have become a form of short-term bearer security and are used for futures contracts, share purchases, and even payment of contractors and mercenaries. They are often found in transactions where payment must be guaranteed but delayed for a short time.

Credit Cards: Credit cards are the primary medium of consumer commerce on Earth and are carried by all citizens as a means of identification and currency. Normally, credit cards are distributed to citizens through major financial institutions, and these institutions have signed agreements with all national governments and colonizing corporations to inlude citizenship data n the cards prior to issue. Each credit card is made of thin plastic impressed with the owner's name, address, and national/corporate identity number on the face. On the reverse of the card are two special optical strips--one fixed, the other programmable, as well as an interface for an optical chip embedded in the card. The fixed optical strip contains an initiator code for the billing computer, which will interrogate the card chip with a verification algorithm.

If the algorithm is correctly executed by the card chip, other information stored on the optical strips can be accessed. A card normally carries the following data on the fixed strip:

- Citizenship
- Identity Number
- User Security Code
- GENPATH Code
- Billing/Shipping Address
- Medical Data
- Machinery Qualification (Motor Vehicle and Air/Spacecraft qualifications)
- The programmable strip holds the following encrypted data:
- Alteration Audit Number (for internal verification by bank computers)
- Credit Rating
- Account Balances.

In the event of an incorrect audit number, or a record of loss/theft in the bank computer, the entire credit card is neutralized in the card reader and security services are notified The optical chip serves as a hardware safety measure by acting as an interface with the card reader terminal. The chip is the other half of the reader processing circuitry and if damaged, the card is rendered useless.

Criminal Gear

CIR Reader: This is a handheld unit carried by talented muggers. The muggers use the CIR reader to strip all the data from a victim's credit card and download it into a CIR counterfieter terminal, which produces a copy of the stolen card and allows the counterfieter access to the victim's accounts. Usually the counterfieter can use the CIR card data for one or two days before the card data is burned or invalidated by the issuer, longer if the theft is not reported. Muggers will typically not use the cards themselves, but will be paid a percentage of the value of the victim's card.

Electronic Lockpick: This is a highly restricted device used by locksmiths and others to penetrate portals secured by the old-fashioned pin-tumbler locks. The lockpick works by applying constant torque to the lock cylinder while each pin is slowly raised in turn. The pick head senses when each pin reaches its shear line and the head moves on to the next pin. Once a lock has been picked, the lockpick can store its configuration in memory (up to 256 combinations) and re-create the pick heights for later use in either picking the lock or making a separate key. The Electronic Lockpick is a 25mm by 300mm wand with replaceable pick heads for vairous inline, circular, and angled-pin locks.

Magnetic Resonance Inducer: This creates powerful magnetic field which can affect microprocessor operations through induction. It is used to jam or otherwise manipulate the microprocessors on computer-operated locks. By placing an MRI next to the lock console, the user can cause the lock to open or close a portal and simultaneously shut out other methods of operating that lock.

Military Gear

PALE/PTI Merge Technology: A common feature of the modern battlefield, PALE/PTI is passive vision technology incorporating ambient light enhancement and thermal imaging into a single near-day image which can use false colors to indicate temperature variations.

Vision Headsets: These are an adaptation of both image intensifiers and PALE/PTI Merge technology in the form of night vision goggles. They allow variable magnification of up to 10x.

> **Nomad GUNCAM Vision Headset:** GUNCAM is a development of NOMAD, a partner in JVR and consists of a single PALE/PTI Merge scope rigged for binocular output. A Fibre-optic cable connects the scope to the vision headset, allowing the goggles to reproduce the scope view in the form of a picture-in-picture display of the headset output image. This means that the wearer can automatically use weapon sights, regardless of stance or facing.

Radeytek Remote Position Monitor (RPM): Radeytek's RPM is intended for use by platoon and strike-team leaders engaging in defensive urban combat. The RPM consists of a set of self contained video transmitters which are linked to a handheld command console. This allows the platoon commander to monitor the status of several key outlying dfeensive positions from relative safety. Each video transmitter is roughly the size of small book (125mm x 200mm x 43mm) and is built around a single CCD camera incorporating PALE/PTI technology. The camera elements are able to scan a 90 degree arc by using a wide-angle lens and digital image reprocessing at the console. Each transmitter also comes equipped with adhesive tape, a magnetic mounting bracket, and an aluminum screw mount. The command console is slightly smaller than the transmitters (110mm x 190mm x 37mm) and incorporates a touch-sensitive color LCD screen capable of displaying up to four incoming images in either split-screen or picture-in-picture display formats. The screen is also capable of being "stealthed" for use with night vision gear by using infrared rather than visible backlighting. System communications are accomplished by sending encrypted video stills every two seconds from each camera. Without the proper key, the console cannot decrypt the image data. Also, for greater security, the image updates can be transmitted using a unique frequency-hopping alorithm, making the units almost unjammable. Camera range is 250 hexes.

Collaris Research Industries Endocrine Implants: While not a technology likely to be encountered in the Jericho campaign, this is included in order that players have some idea of the scope of technological development. All data on Endocrine Implants should be treated as rumor. The implants consist of animal endocrine glands which have been genetically modified to produce a specific hormone or biological medication, and offer great promise in the treatment of various endocrine maladies, such as diabetes. However, there are rumors that these devices will be used in crude forms of eugenics and population control. The implants are controlled by a bacterial computer which is a wonder of nanotech engineering. The computer can regulate hormone production in the implant in response to body conditions or external stimuli. Possible applications include the supplemental production of adrenaline for elite troops, production of endorphins for pain therapy and recreation, the production of hypnotic drugs for control of individuals, especially criminals. A more controversial suggested use of the implants is the production of estrogen as a means of curbing violence in dangerous male criminals.

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Page last modified: August 27, 2000

PHOENIX COMMAND

RPG: Jericho Small Arms

JERICHO

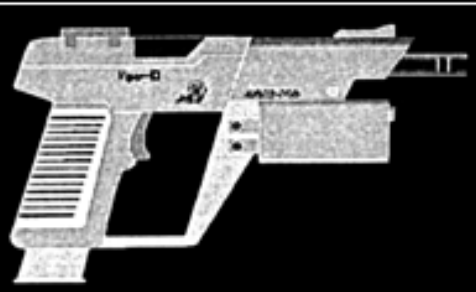
Havril Hellstorm 6.5mm PDW
PDW
6.5 x 29mm Caseless

Physical Data		Aim Time AC	ALM	Ballistic Data		
		1	-22	FMJ	PEN	14
W	7.2	2	-11		DC	6
		3	-9			
RT	8	4	-7	JHP	PEN	14
ROF	*6	6	-4		DC	8
		8	-2			
Cap	40			AP	PEN	20
					DC	6
				JFC	PEN	13
					DC	9

This is an illegal submachinegun thought to be designed by ex-Micor engineer Sussanne Hawnt. The Hellstorm has only recently begun appearing in any numbers and is thought to be produced on pirated Computer Assisted Manufacturing equipment. The 6.5 x 29mm caseless ammunition is not a standard calibre and is produced by the Hellstorm manufacturers. The ammunition is specially designed for penetration of body armor and has a tendency to precess wildly inside human targets, causing erratic wound channels.

The Hellstorm is slightly larger than many other machineguns, but incorporates many of the same features, including scope rails, a collapsible stock and standard universal mount for underbarrel armament. Unlike other submachineguns, however, the Hellstorm cannot accept a silencer as its ammunition is supersonic. The Hellstorm also includes an integral diode laser sight.

JERICHO

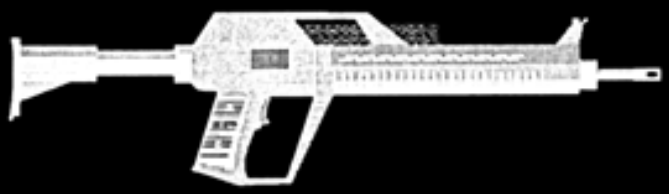


Magnum Design
P-37 10 mm Magnum Viper-10
Pistol
10 mm Magnum

Physical Data		Aim Time AC	ALM	Ballistic Data		
		1	-19	FMJ	PEN	4
W	4	2	-12		DC	6
		3	-10			
RT	4	4	-9	JHP	PEN	na
ROF	*	6	-7		DC	na
Cap	'6/12			AP	PEN	6
					DC	5
				JFC	PEN	3.9
					DC	7

The P-37 Viper-10 is a large frame autopistol firing the 10mm pulse rifle round. This firearm has been adopted by several West Asian security forces as standard issue and is being evaluated by the United States Justice Department. The P37 enjoys a strong market among the corporate elite, who have taken to purchasing the nickel-plated P37A1 as a status symbol.
The firearm is quite heavy, and this helps to counteract some of the recoil of firing the very powerful caseless rifle ammunition. An advanced design of muzzle brake eases the rest of the recoil, but in the words of one shooter "Firing the gun is like having your hands explode." It is a very powerful and loud gun. A forward grip and collapsible stock are available as options, while tritium nightsights and scope rails are standard. The P37 civilian versions come with standard 5 round magazines, but the larger 12 round versions intended for law enforcement or military use are also available on the black market.

JERICHO

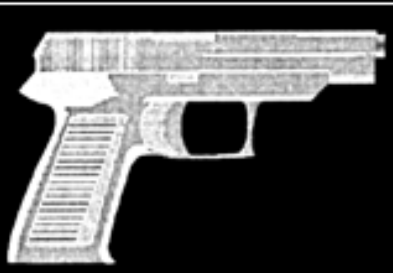


Startech PBX-92 10mm Assault Rifle
Assault Rifle
10 x 39mm Caseless

Physical Data		Aim Time AC	ALM	Ballistic Data		
		1	-22	FMJ	PEN	12
W	8.5	2	-12		DC	6
		3	-9			
RT	8	4	-7	TDS	PEN	10
ROF	*6	6	-4		DC	3
		8	-3			
Cap	70	11	0	AP	PEN	13
					DC	6
				JFC	PEN	11
					DC	7

The PBX-92 Scorpion is a new Startech-engineered assault rifle firing standard 10mm ammunition. It is much lighter than the ICW rifle and incorporates extensive ergonomic engineering to permit greater combat accuracy. The rifle features integral tritium night-sights, a top mounted magazine, and the capability to accept any standard underbarrel weapon like a grenade launcher. The Scorpion is issued with a PALE/PTI merge scope and attached IR laser-assist aiming device. This rifle has started appearing in Startech Corporate military and Striker units.
Some special ammunition developed includes the TDDS-C (Triple Dart Discarding Sabot--Consumable) cartridge, which is a flechette round holding three separate steel darts in a plastic sabot. The plastic casing of the TDDS round is consumed on firing and will load in and standard 10mm x 39mm weapon.

JERICHO



Thorne-Straker TS M299 9mm Auto Pistol
Pistol
9mm Caseless

Physical Data		Aim Time AC	Aim Time ALM	Ballistic Data		
		1	-18	FMJ	PEN	1.8
W	3.1	2	-11		DC	3
		3	-9			
RT	4	4	-9	JHP	PEN	1.9
ROF	*	6	-7		DC	4
Cap	'5/18			AP	PEN	1.5
					DC	5
				JFC	PEN	5.5
					DC	3

The civilian market for firearms was very restricted on major worlds until only recently, when urban decay and criminal violence forced legislators to liberalize internal security laws and permit private possession of firearms by licensed and trained users. The police products firm of Thorne Straker then modified its police handgun for sale as the TS 299C autopistol. The civilian pistol has a limited capacity magazine and a retaining bolt prevents full-capacity police magazines from being loaded. The police version 299 holds a 18 round double column magazine while the 299C only accepts modified 5 round magazines. The 299C has seen many purchasers among Terran middle class civilians and among upper class women, who prefer the 299C Designer, which is nickel plated to a mirror finish and has switchable colored grips. The fashion accessories are of dubious value in such a market; more important is the comfortably low recoil compared to the P37.

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Page last modified: August 27, 2000

PHOENIX COMMAND

Modern Canadian Mechanized Infantry

Special thanks to Corporal Jade Ohlhauser for assistance with the research.

Canadian Infantry Platoon Table of Organization & Equipment:

The Canadian military has seen service in several foreign wars, from the Second Boer War to the Gulf War, and is most noted for its expertise in Peacekeeping, where Canadian units have served on almost every United Nations Peacekeeping mission since the inception of the Peacekeeping role of the United Nations. More recently, Canadian units have been used for internal security at the Oka, Quebec crisis and on peacekeeping in Bosnia.

The Canadian Land Forces are (finally) getting new equipment, and the organization charts below show the state of the Canadian Mechanized Infantry Platoon in the 1990s, which consists of a Platoon HQ and Weapons Section, and 3 Rifle Sections, all carried within 4 APCs. The APCs are being modernized at present, so Canadian Infantry could, depending on the time frame, actually use one of three types of APCs.

Currently being phased out is the venerable M113, which is still in service in some units. For the UN mission to Somalia, the Canadian Airborne Regiment (now disbanded) appropriated the LAV-APC "Bison" from Canadian reserve units. Currently, the APC just coming into service is the Kodiak, which is a slightly larger version of the LAV-25.

PC Mech Rules Modifications for Canadian APCs

The following Rules modifications are designed to allow players to easily integrate the following vehicles into a PC Mech game. Ideally, we would have status sheets custom made to each vehicle, which is not practical within the context of this website.

M113:
No modification

Bison (LAV-APC):
Use LAV-25 Status Sheet, re-roll Turret hits as the Bison has no turret. Replace "Turret Lip" location with "Heavy Machine Gun, PF: 6/6" to represent the commander's Cupola. The weapon mounted is the M2HB. Increase Hull Target Size by +1 on table 3 of the LAV-25 Status sheets to represent the enlarged Hull/Dismount Section compartment.

Kodiak:
Use LAV-25 Status Sheet. Increase Hull Target Size by +1 on table 3 of the LAV-25 Status sheets to represent the enlarged Hull/Dismount Section compartment.There are reports that the Kodiak has bolt-on armour panels to increase its protection against weapons fire up to 30mm. As soon as I have more information on this, I'll update this page.

Coyote (LAV-RECCE):
This is a Reconnaissance version of the LAV-25. Externally identical to the LAV-25, the Coyote is packed with sensors and radio gear, as well as an extensible, mast-mounted thermal imaging camera. Replace Hull Side Hot Location "57-60" with the hit location "Camera". If the camera is extended (PF: 6/6), any hits on that location will only hit the camera and will not penetrate into the Fuel tank. If the camera is retracted (PF:24/24), then any hits in that location will have their normal chance of penetrating the Fuel tank.

Platoon Organization Charts

Platoon Headquarters	#	**Weapon FP Value**	**Total FP Value**	**Morale Grade**
				Crack
Platoon Commander	1	5	5	
Rifleman (C7 Rifle)	3	5	15	
Total	**4**		**20**	

Weapons Section	#	**Weapon FP Value**	**Total FP Value**	**Morale Grade**
				Crack
Rifleman (C7 Rifle)	3	5	15	
Machine Gunners (C6 GPMG)	1	9	9	
AT Gunner (Carl Gustav 84mm)	1	5/38	5/38	
Total	**5**		**29/52**	

The Platoon HQ and Weapons Section ride in 1 APC. Each of the Three Rifle Sections is also assigned its own APC.

Rifle Section	#	Weapon FP Value	Total FP Value	Morale Grade
Section Commander (C7 Rifle)	1	5	5	**Crack**
Section 2IC (C7 Rifle)	1	5	5	
Radio Operator (C7 Rifle)	1	5	5	
Rifleman (C7 Rifle)	5	5	25	
Machine Gunners (C9 SAW)	2	13	26	
Total	**10**		**66**	

Each section member carries 150 rounds for their C7. As well everyone carries 200 rounds for the C9s. The C9 gunner themselves I think carry 200 rounds in a drum on the gun and 200 on the webbing. In addition, each member carries an M72A2 SRAW, which boosts firepower up to 28 per member, or 280 overall.

For those unfamiliar with Canadian military designations, a C7 is an M16A2 rifle produced under license by Diemaco. It differs from the M16A2 issued to U.S. Military personnel in that it replaces the Three-round burst option with Full Automatic fire. U.S. Military M16A2s have no full automatic fire option. The C9 refers to the Belgian Minimi Squad Assault Weapon, designated M249 in U.S. Military service. The C6 is the Belgian FN Mag-58 GPMG.

Everyone is paired into two man teams, the commander is with the rad-op and the 2ic is with one of the machine gunners. This set up may be changed according to the commander's discretion. For tactical purposes the section is divided into two groups.

When advancing upon the enemy positions the commander forms the section into an "extended line" with everyone facing the enemy. Starting with a "section attack" one group covers while the others advance. Then "group attack" starts and teams cover while the other advances. Finally "team attack" begins where one team member covers the other.

Phoenix Command Miniatures Section Organization:

Unit 1 (Group 1)	Weapon	Troop Quality
Section Commander*	Assault Rifle	**Elite**
Radio Operator	Assault Rifle	
Machine Gunner	SAW	
Assistant Gunner	Assault Rifle	
Rifleman	Assault Rifle	

Unit 2 (Group 2)	Weapon	Troop Quality
Section 2IC*	Assault Rifle	**Elite**
Rifleman	Assault Rifle	
Machine Gunner	SAW	
Assistant Gunner	Assault Rifle	
Rifleman	Assault Rifle	

Platoon Command Sections and Weapon Sections translate directly into units in Phoenix Command Miniatures

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Page last modified: January 04, 2002

North Korean People's Army Infantry Platoon

Table of Organization & Equipment:

North and South Korea have been enemies since just after World War II, and the leadership of late North Korean leader Kim Il Sung committed the countries to a path of mutual hatred. Kim Il Sung's stated goal was the reunification of the two Koreas under Communist rule, and North Korea made many covert attempts to accomplish this goal. Only the presence of a dedicated South Korean military and U.S. Troops stationed on Korean soil kept North Korea from making more overt efforts.

The threat of a potential North Korean invasion of South Korea has been a constant scenario in U.S. military planning, as this country is a potential flashpoint from which World War III could be started. In the 1980s, the WWIII threat was presented by a clash between the U.S. and Soviet Union on the peninsula. Now, the threat is posed by a U.S.-China clash, which is a much more remote, but still potential conflict.

Since Kim Il Sung's passing, news reports have started coming out of North Korea of widespread famine and economic collapse. Whether this will increase or decrease the potential for conflict is anyone's guess.

The following table presents the standard structure of a North Korean infantry platoon. Players can modify this platoon as needed for their scenarios. I have chosen to make the platoons line quality. At their peak, NKPA forces could have been considered crack or line. In their present state of economic collapse, the NKPA troop quality becomes heavily variable (just like all collapsing communist militaries)--anywhere from Green to Line.

Platoon Organization Charts

Platoon Headquarters	**#**	**Weapon FP Value**	**Total FP Value**	**Morale Grade**
				Line
Platoon Commander (T-64-68)	1	1	1	
	Total	**1**	**1**	

There are three rifle squads in each platoon, each broken down into three four-member teams.

Rifle Squad	#	Weapon FP Value	Total FP Value	Morale Grade
Squad Leader (AK-47)	1	5	5	**Line**
Team Leaders (AK-47)	2	5	10	
Riflemen (AK-47)	3	5	15	
RPG Gunner (AK-47/RPG-7V)	3	5/38	15/114	
Machine Gunners (RPD)	3	10	30	
Total	**12**		**75/170**	

Phoenix Command Miniatures Rifle Squad Organization:

Unit 1	Weapon	Troop Quality
Squad Leader*	Assault Rifle	**Professional**
Machine Gunner	SAW	
Rifleman	Assault Rifle	
RPG Gunner	Assault Rifle/RPG	

Unit 2	Weapon	Troop Quality
Team Leader*	Assault Rifle	**Professional**
Machine Gunner	SAW	
Rifleman	Assault Rifle	
RPG Gunner	Assault Rifle/RPG	

Unit 2	Weapon	Troop Quality
Team Leader*	Assault Rifle	**Professional**
Machine Gunner	SAW	
Rifleman	Assault Rifle	
RPG Gunner	Assault Rifle/RPG	

Modern Spanish Mechanized Infantry

Table of Organization & Equipment:

By Juan Luis Perez Borrego

A Spanish mech platoon has an organization that is the same for any infantry outfit in the Spanish army, the Infanteria de Marina (marines) belongs to the Navy and gets different equipment.

A platoon consists of 3 squads each with the following

Rifle Squad	**#**	**Weapon FP Value**	**Total FP Value**	**Morale Grade**
Sergeant (Cetme L/G36)	1	5	5	**Line**
Corporal (Cetme L/G36)	1	5	5	
Riflemen (Cetme L/G36)	7	5	35	
MG (MG3)	1	13	13	
Total	**9**		**45**	

As for statistics for each weapon I use the G3 for the CETME C, the SIG 33 for the L , and in the Mech supplement I tweak with the factors of the M16 and the M60 to get the ones I need , altering the BTR templates to represent the BMR 600, as is the vehicle used in Bosnia where I place most of my scenarios.
I hope the info will come handy, any more doubts just tell me!
Regards

They ride in a M113 with the driver never leaving the vehicle and the sergeant operating the pintle mounted .50 cal., the BTR 600 used in many infantry units, is a six wheeled battle taxi with a remotely controlled .50 cal turret

The AR is the CETME C during the ´70 and ´80 and the L during the ´90. The CETME C is the same rifle as the German G3 being designed by WWII german engineers that flew to Spain at the end of the war, the L is the 5´56 version of the same weapon and is being replaced by the new German G 36. The machine gun is always the MG3 (MG42). Each squad is equipped since 1990 with 5 or 6 C90, a modern version of the M72 LAW a step below to the British LAW 80, some units still using the local version of the "super bazooka".

As for statistics for each weapon I use the G3 for the CETME C, the SIG 33 for the CETME L , and in the Mech supplement I tweak with the factors of the M16 and the M60 to get the ones I need , altering the BTR templates to represent the BMR 600, as is the vehicle used in Bosnia where I place most of my scenarios.

Phoenix Command Miniatures Rifle Squad Organization:

Unit 1	**Weapon**	**Troop Quality**
Sergeant*	Assault Rifle	**Professional**
Rifleman	Assault Rifle	
Machine Gunner	SAW	
Assistant Gunner	Assault Rifle	
Rifleman	Assault Rifle	

Unit 2	**Weapon**	**Troop Quality**
Corporal*	Assault Rifle	**Professional**
Rifleman	Assault Rifle	
Rifleman	Assault Rifle	
Rifleman	Assault Rifle	

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Page last modified: January 04, 2002

Modern US Army Infantry

Table of Organization & Equipment:

Phoenix Command Miniatures Rifle Squad Organization:

Unit 1	Weapon	Troop Quality
Squad Leader*	Assault Rifle	**Elite**
Fire Team Leader	Assault Rifle	
Automatic Rifleman	SAW	
Grenadier	Assault Rifle/GL	
Rifleman	Assault Rifle	

Unit 2	Weapon	Troop Quality
Fire Team Leader*	Assault Rifle	**Elite**
Rifleman	Assault Rifle	
Automatic Rifleman	SAW	
Grenadier	Assault Rifle/GL	

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Page last modified: January 04, 2002

Modern US Army Infantry -- Dismount Section

Table of Organization & Equipment:

This is the unit carried in the M2 Bradley MICV that dismounts from the MICV for combat operations

Phoenix Command Miniatures Rifle Squad Organization:

Unit 1	**Weapon**	**Troop Quality**
Team Leader*	Assault Rifle	**Elite**
Automatic Rifleman	SAW	
Grenadier	Assault Rifle/GL	

Unit 2	**Weapon**	**Troop Quality**
ATGM*	Assault Rifle/ATGM	**Elite**
Automatic Rifleman	SAW	
Grenadier	Assault Rifle/GL	

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Page last modified: January 04, 2002

German WWII SS Panzergrenadier (1944-1945)
Table of Organization & Equipment:

Over the course of WWII, attrition and the pressures of mechanized warfare meant that units of all nationalities often had organizations in no way resembling their "official" TO&E. Units of all sides made use of captured enemy equipment where practical, and with new equipment being frequently sent to the front lines, units could change in composition overnight. The following organization, therefore, is to be considered a starting point from which Phoenix Command players can build.

An additional note on the Waffen SS: Troop quality in this branch of service was highly variable, ranging from raw recruits to elite, a situation which became even more diverse in the closing years of the war, and as troop quality varied, so did equipment. Phoenix Command players choosing to play with the Waffen SS should take this into account, so that a unit from the 28th "Wallone" Waffen Grenadier SS Division (Crack troop quality) may have Stg 44's and Gew41s , while a unit like the 38th "Nibelungen" (Novice to Untrained troop quality) may still be making do with Mauser Kar 98k's. For a unit in the latter case, use the FP values in brackets on the tables below.

Platoon Headquarters	**#**	**Weapon FP Value**	**Total FP Value**	**Morale Grade**
				Variable
Platoon Commander (MP44)	1	2	2	
Riflemen (Stg 44/Kar 98k)	2	5 (2)	10 (4)	
Sniper (Gew 43/Kar 98k)	1	5 (2)	5 (2)	
Medic (P-08)	1	0.4	0.4	
Total	**5**		**17.4 (8.4)**	

Depending on the platoon, many units had either three or four infantry squads/groups in their composition, but most were standardized on three squads per platoon.

Infantry Squad/Group	#	Weapon FP Value	Total FP Value	Morale Grade
Squad Leader (MP 44)	1	2	2	**Variable**
Squad 2IC (MP 44/Kar 98k)	1	2	2	
Machine Gunners (MG42)	2	13	26	
Riflemen (Kar 98k)	2	2	4	
Riflemen (StG 44/Kar 98k)	3	5 (2)	15 (6)	
PanzerSchreck (Kar 98k)	1	21/2	21/2	
Total	**10**		**70/51 (42)**	

The Panzerschreck gunner and loader carried as little as 4 rounds for the Panzerschreck. In the above organization, the Panzerschreck gunner is assumed to carry or have access to a Kar 98k. Use the Firepower of 70 when the Panzerschreck is being used in an anti-personnel role, 51 if the Panzerschreck gunner has switched over to a rifle, or 42 if the entire team is kitted with Kar 98k's.

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Page last modified: January 04, 2002

Since starting on the World War II TO&E in the October revision of the website, I have received not a few offers to help in expanding the source material on this page. This page comes to us courtesy of Panzerfaust, who profiles the German Fallschirmjager. I have included the platoon organization tables at the end of the page to give a "base unit" which can be built up to suit any particular scenario. Any errors in those tables are mine, not Panzerfaust's.

German WWII Fallschirmjager (1940-1945)
Table of Organization & Equipment:

By Panzerfaust

The Fallschirmjaeger are the easiest to start with.All were technically elite even in 44 when more than 160,000 were active.The training even without actual combat jumps was sufficient to create a light infantry force only matched by the Allied elite (Commandos,SAS,some Russian specials etc ,not regular airborne or even rangers of the day) Indeed as demonstrated at Casino they made the ideal defenders in the face of allied doctrine.

A typical rifle company would consist of an HQ unit of 1 officer and 35 enlisted and 3 rifle platoons of 1 officer and 38 enlisted divided into 3 squads of 12-13 men (on paper of course)The Platoon ideally was a mix of about 16 rifles(by 44 a mixture of FG42s and MP44/MP43 with a number of Gewehr 33/40 for sniper work),9 MP-40s(officers and senior NCOs),and 6 machine guns (double the number in regular infantry squads).The machine guns were most often the MG34 as the MG42, while slowly supplanting it, was judged less desirable due to its increased weight and difficulty deploying.Also most Paras carried a pistol when possible.A throw back to the early days in Holland and Crete where these were the only weapons carried in the jump,with the rest in containers).

Usually a number of special weapons were issued or just plain scavenged in the fighting to increase the firepower of the unit.These range from picked up ATK rifles which proved their value even in nonarmored fighting on the eastern front (Russians loved their rifles and partially pioneered their use as AMRs over ATK as well as sniper work) to light mortars(5cm leichter granatenwerfre 36) and Panzerfausts/Schrecks.

The Schreck proved its value in Northern Europe especially in hedgerow fighting and usually was found 1 per squad with limited rounds due to the supply state. The 'fausts were usually kept in their sealed containers till needed just prior to use. They had to be armed ahead of

time. You might find anywhere from 6-8 in a well supplied squad.

The Jaegers also had more access to specialist weaponry such as the Shaped Charges and Flamethrowers (Eintoss Flammenwerfer) making them very unpredictable opponents.

As to experience levels they were various (some fought through Holland,Crete (a lifetime on its own), the east and west till the end) But none realistically can be judged as green.Line would seem the lowest ranking due to their training and comradeship which was superior to the SS in all honesty.

The allies could always tell when they were fighting units such as the Fallschirm by their non-M1935 helmets,jump boots, and special Combat jumpsuit/camoflaged smocks.This was appreciated by the Germans who enjoyed the distinction ,unlike the Luftwaffe field divisions whose blue uniforms made them stand out more than the WW1 french pantalon rouge to the enemy who knew their weakness. Also it was quite common even in '44-45 for platoon sized units to air drop at key points either behind enemy lines or in the line of advance. Nothing the scope of Arnhem but truly incredible all things considered.

Platoon Headquarters	**#**	**Weapon FP Value**	**Total FP Value**	**Morale Grade**
				Elite
Platoon Commander (MP40)	1	2	2	
Riflemen (MP 40)	2	2	4	
Total	**3**		**6**	

Including 3 Infantry Squads/Groups:

Infantry Squad/Group	**#**	**Weapon FP Value**	**Total FP Value**	**Morale Grade**
Squad Leader (MP 40)	1	2	2	**Elite**
Squad 2IC (MP 40)	1	2	2	
Sniper (Gew 33/40)	2	2	4	
Machine Gunners (MG34)	2	13	26	
Riflemen (FG 42)	5	5	25	
Panzerschreck (FG 42)	1	21/5	21/5	
Total	**12**		**80/64**	

Panzerfaust has also provided his notes on the organization and equipment of the Kurstenjager (Coastal Raiders) of the Division Brandenburg I have included the platoon organization tables at the end of the page to give a "base unit" which can be built up to suit any particular scenario. Any errors on those tables are mine, not Panzerfaust's.

German WWII Kurstenjager (1943-1945)
Table of Organization & Equipment:

By Panzerfaust

The Coastal Ranger is just a unique option for anyone who wants to role play a German special forces unit circa 1943-45.This unit was part of the elite Brandenburgers who themselves provide a lot of specialist options.

The Rangers were formed by the Heer in December of 42 after the Kriegsmarine under Raeder refused the mission.A company was formed from the ranks of the Heer Wasserpionieren (water engineers).Using Italian experience and methods the Germans started building an aquatic special operations group of commandos/marines,frogmen,and explosive attack boats. By late 1943 a composite battalion had been formed.

The unit was deployed mainly in the Med and Black sea.And enjoyed some spectacular successes leading many to believe that had they and their navy counterparts been formed before the war or early in it they might have tipped the blance to Germany's favor hands down.

A sailboat raid in Tunis,attacking soviet shipping,and destroying bridges earned these men fearsome reputations but the most telling instance was in the capture of the Aegean islands of Kos and Leros that had been surrendered by their former Italian allies. Spearheading the assaults to take these islands the rangers were forced to come ashore against a ready and numerically superior enemy,due to broken codes.Even so they fought to and won their objectives and the islands fell, prolonging the war and keeping Turkey neutral.

Little standard applies to these units although their training was relatively normal in most regards.Only specialist training at sites like La Spezia and Agra island were unique over standard Brandenburger procedures.Weaponry varied with very little emphasis on heavy weapons as these troops were raiders and scouts.

A typical mission might have been:

19 men,1 officer in 2-3 boats with the mission of scouting a coastline or capturing a prisoner or two.Weapons would range from pistols and MPs to a handful of captured allied weapons such as Enfields or Brens. Later weapons like the Panzerfaust were issued on a limited basis .Assault detachments had a wide range of demolition gear available as well as access to heavier weapons such as MG42s or mortars.(note the units always had at least one MG34 or 42 handy).

In World War 2 nearly a million experienced german troops were wasted protecting the Reich's coastline from allied threats such as the Commandos and not available at key battles like Kursk or D-Day.Later in the war less than 100 German frogmen alone tied up several thousand allied troops in protecting bridges and waterways.This type of warfare in WW2 gets glossed over for the more dramatic Blitzs but was crucial to the war efforts of both sides. And its fun to run as a scenario instead of the standard SEAL team rescuing POWs in Vietnam or SAS clearing terrorists out of an Embassy.

Kurstenjager Team	**#**	**Weapon FP Value**	**Total FP Value**	**Morale Grade**
				Elite
Team Commander (MP44)	1	2	2	
Raiders (MP44)	18	2	36	
Machinegunner (MG 42)	1	13	13	
Total	**20**		**51**	

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While doing some reading on WWII, I ran across an interesting tactical organization used by the Red Army in WWII during the defence of Stalingrad.

Soviet 62nd Army Storm Group (1942-1943)
Table of Organization & Equipment:

In 1942, the Red Army was regaining its strength after the massive defeats it had faced in the prior year during the German Barbarossa offensive. The 62nd Army, under Lt. General V.I. Chuikov was tasked with the defence of Stalingrad.

Chuikov recognized the need to neutralize the Wehrmacht's superiority in armor and air support, and in Stalingrad, he recognized that the terrain would give him significant advantages in doing just that. Chuikov also recognized the assets of the Russian soldier of 1942, who was a very highly motivated and tenacious fighter. So, in order to defend Stalingrad and the Rodina, Chuikov adopted a tactical organization of assault groups or storm groups that made use of the terrain and his riflemen.

Storm Groups were platoon sized or larger and tailored to the mission. Their role was one of active defence--they would stage assaults on forward German positions to make the Germans bleed for every inch of Russian soil. The Germans never did manage to counter the Storm Group tactics, and Storm Groups were used right up to the liberation of Stalingrad.

Storm Groups were built around two or more Assault Teams, consisting of a leader and 8-10 men. Supporting these assault teams was a Reinforcement section consisting of Antitank groups, Mortar Groups, Machinegunners, and specialists, such as demolitions teams, snipers, or flamethrower teams. Providing further support was a reserve detachment organized into two or more assault teams.

In action, the assault teams would use stealth and speed to approach a German position, holding their fire if possible until they were right on top of their objective. Then they would use grenades, submachineguns and even entrenching tools and shovels to disrupt and suppress and ultimately kill or drive out the German soldiers on the objective. Once the assault teams were on the objective, they would signal the Reinforcement section to move up and secure the flanks. During this time, the assault temas would be cleaning up the objective, and fortifying it against counterattack, or as a staging point for the next storm group operation.

Other missions performed by Storm Groups includedraids on enemy supply lines, and even tunnelling under German positions to set explosives.

Storm groups appeared when the 62nd Army was desperately trying to hold on to Stalingrad in September, 1942, and the organization grew out of the use of traditional rifle groups, which did not have the firepower to maximize assault tactics. Storm groups eventually were found in every division that fought in Stalingrad.

The following tables provide a sample storm group organization, and players can use this as a base from which to build organizations for their own scenarios. I have given the Storm Groups Crack morale, since all the storm groups were composed of volunteers,

Headquarters Team	#	**Weapon FP Value**	**Total FP Value**	**Morale Grade**
Team Commander (PPsh41)	1	2	2	**Crack**
Messengers (PPsh41)	3	2	6	
Total	**4**		**8**	

Including 2 Assault Groups:

Assault Team	#	**Weapon FP Value**	**Total FP Value**	**Morale Grade**
Team Commander (PPsh41)	1	2	2	**Crack**
Troopers (PPsh41)	10	2	20	
Total	**11**		**28**	

The Reinforcement Section Consisted of the following elements:

Machinegun Section	#	**Weapon FP Value**	**Total FP Value**	**Morale Grade**
				Crack
NCO (PPsh41)	1	2	2	
Troopers (PPsh41)	6	2	18	
Machinegunner (DShK.50*)	2	10	20	
Total	**9**		**40**	

Mortar Section	#	Weapon FP Value	Total FP Value	Morale Grade
				Crack
NCO (PPsh41)	1	2	2	
Mortar Gunners (PPsh41)	2	2	4	
Mortar Crew (PPsh41)	6	2	12	
Total	**9**		**18**	

The Mortar section is equipped with two 82mm Mortars.

Antitank Section	#	Weapon FP Value	Total FP Value	Morale Grade
				Crack
NCO (PPsh41)	1	2	2	
Antitank Crew (PPsh41)	10	2	20	
Antitank Rifles (ATR*)	3	2	6	
Total	**14**		**28**	

The antitank crews were armed with two 45mm Antitank guns, and three Antitank rifles. I do not have any data on these at the moment, but I will update this page as soon as more data comes available.

In addition to the above elements, the storm group also included a reserve detachment consisting of two or more assault groups and one Headquarters group. Also, Storm groups would also make liberal use of flamethrower teams, demolitions teams, and snipers. These can be added almost anywhere to the organization.

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French WWII Armoured Infantry (1938-1941)
Table of Organization & Equipment:

By Panzerfaust

More info gleaned over the years, this time for any wishing to run Frenchmen from 1938-41 (this organization lasted well into Vichy periods and was even beginning to be adopted by colonial forces in Syria before their removal)

Building a mechanized warmachine that dwarfed and eventually might have surpassed the fledgling Wehrmacht was a French goal. One that if not for the Old school and the hard needed currency spent on Maginot might have come to pass. Combined arms doctrine originated in French circles but adopted by the Germans with their usual efficiency in practice. Unable to acquire the proper command elements such as radios the formation of proper mechanized formations lagged but was certainly real. Who knows another couple of years and superior equipment used in action instead of reaction would have relegated the Outmoded and poorly equipped Wehrmacht into the place now held by the French Military of WW2 (or even half baked use during Poland for that matter).

While building purpose ridden formation like the tank divisions of France the call went out for Mechanized infantry known as dragons portes. These men would eventually be formed into division Legere mechaniques to support the armored spearheads such as the german Panzergrenadiers.

The basic squad was as follows.

Rifle Section	#	Weapon FP Value	Total FP Value	Morale Grade
Fusilier Team				Line

Driver (Lebel M1892)	1	0.2	0.2
LMG (Chatellerault FM 24/29)	1	9	9
Loader (Lebel M1892)	1	0.2	0.2
Riflemen (MAS 36)	3	2	6

Eclairer Team				**Line**
Team Leader (MAS 36)	1	2	2	
Driver (Lebel M1892)	1	0.2	0.2	
Rifle Grenadier (MAS 36)	1	2	2	
Riflemen (MAS 36)	3	2	6	
Total	**12**		**25.6**	

Both teams had their own tankette and armored trailer (APC) attached.

Note some formations replaced the Eclairer team with a second Fusilier Team for greater firepower. Although they retained the Rifle grenadier.
The remainder of the unit was fairly standard with 4 platoons each in 3 Squadrons. A platoon being of 3 squads with a HQ detachment. Fire support Squadron brought more 8mm Hotchkiss mgs as well as 81mm mortars superior to the germans.

But alas for the cream of the french footsoldier there was neither the will nor the time to employ them as trained. Instead they faced the situation they were designed to create on the wrong side. And an offensive doctrine used solely to parry quickly breaks the blade and loses the fight.

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Submission in Russia makes you believe there is uniformity.

Correct this idea.

Nowhere is there a country where there is such diversity of races, of customs, of religion or mentality as in Russia.

- Czar Nicholas I

In late 1993, I had started work on a scenario pack for LEG called **Red Embers: Legacy of the Soviet Union**. This was to be the follow-up to the **Russian Roulette** scenario pack, and was to chronicle the wars and battles that occurred in the Commonwealth of Independent States from 1992 onwards. Unfortunately, LEG ceased operations before the manuscript could be completed. Reproduced in full on these pages are all the scenarios that would have been included in Red Embers.

INTRODUCTION

A seventy-five year experiment with Communism that had divided the world into Eastern and Western spheres of influence ended on an August day in 1991 when the tanks rolled into Moscow. Within days, the political masters directing the tanks had been swept out of office in the face of popular dissent. The collapse of the Communist government caused the shattering of the Soviet borders, unleashing fifteen new nation-states upon the world in the first step in restructuring world politics and forcing the world to search for new stabilities.

Within the old Soviet Union, however, there were a series of civil wars that erupted as ethnic nationalities were finally allowed to vent their anger. The old political science didn't work anymore--the Soviet Union was no longer around to keep the peace within what had once been its own borders. What resulted was a paradigm shift to a new world chaos.

This Scenario Pack is the sequel, in a sense, to 1992's Russian Roulette Scenario Pack for the Phoenix Command Small Arms Combat System. Like Russian Roulette and other PCSACS scenario packs, Red Embers features a number of scenarios which cover the clashes in the former Soviet Republics during 1992 and 1993. Each scenario has a full description of the setting, special rules for unusual situations, and a map that can be enlarged for tabletop play.

This scenario pack features a mix of scenarios for the Small Arms and Mechanized Combat System scenarios, allowing the supplement to be used with both.

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DNIESTER REPUBLIC/MOLDOVA

When there is a war going on...we cannot stand idly by. We simply must respond. We simply must do that, defend the people in order to stop the bloodshed.

- Boris Yeltsin

June 21, 1992

June 20, 1992 The rejection of a Moldovan peace plan intended to reunite the Moldovan and Dniestrian republics led to more bloodshed.

The Dniester republic declared its independence from Moldova in 1991 when the Russian-speaking Dniestrians feared that they would become subsumed by a planned reunification between Moldova and Romania. A series of clashes followed independence as the Moldovan government refused to recognize the breakaway republic. The Russian 14th Army was deployed to the region to act as peacekeepers, but ultimately, they would become drawn into the fighting on the side of the Dniestrians.

On June 20, 1992, the Dniestrian government rejected a peace proposal put forward by the Moldovan parliament. An incident where Moldovan police in the town of Bendery, the only Dniestrian stronghold west of the Dniester River, arrested Dniestrian guardsmen, escalated into a Moldovan offensive against the Dniester Republic. The town of Bendery was the scene of heavy fighting control see-sawed between Dniestrian and Moldovan forces over the course of two days. The battle for the city saw the direct intervention of the 14th Army on the side of the Dniestrians, and almost sparked a state of war between Russia and Moldova.

Scenario Outline: This is a Mechanized Combat System scenario which deals with the night assault to recapture Bendery from Moldovan forces. The Russian 14th Army has joined with Dniestrian infantry in attempting to cross the Bendery-Tiraspol bridge. Dniestrian irregulars are fighting for control of the Bendery bridgehead and Moldovan forces are trying to prevent the assault.

This scenario is a large scenario, involving a tank company, a motor rifles company, and numerous infantry and artillery units on either side. Team play is strongly recommended for this scenario, with each player being given command of a company or so. For games with a single player to each side, players should read the notes on Smaller Scenarios at the end of this section.

The scenario takes place at night under a half-moon, with a wind of 1 MHPT blowing from the east.

Order of Battle:

Moldovan Forces:
Moldovans are on the defensive in this scenario. They must beat back the combined Russian/Dniestrian attack and prevent the Russians and Dniestrians from achieving their victory conditions.

Elements, Tank Company
Company Assets:
1 T-72M1, Line

Platoon 1:
3 T-72M1, Line

Platoon 2:
2 T-72M1, Green

Platoon 3:
1 T-72M1, Line
2 T-72M1, Green

Divisional Reconnaissance Company
Company Assets:
1 BMP-2, Crack

2 x Motor Rifles Platoon, each with
1 BMP-2, Line
2 BMP-2 with Dismount Squad, Green

Elements, Tank Platoon:
2 T-72M1, Line

Moldovan Nationalist Militia
Infantry Platoon:
1 Motor Rifle Squads, Line
3 Motor Rifle Squads, Green

Artillery Battery (off board, Firebase Level), with:
4 x 2A36 Howitzers
Ammunition Loadout per howitzer:
HE: 30
WP: 6
Illumination: 4
Mortar Battery:
3 x M-36 Mortars
Ammunition Loadout per Mortar:
HE: 15
WP: 3

Illumination: 2

3 Gaz-66 Trucks

1 Gaz-66 Ammunition Carrier with
2 Ammunition Loads per mortar

Russian/Dniestrian Forces:
The Russian and Dniestrian forces must recapture Bendery from the Moldovan forces presently holding the city. There are a number of key objectives marked on the map in Bendery, and if the Russian/Dniestrian forces can capture these, then they will have won the battle for the present.

Tank Company, organized as follows:
Company Assets:
1 T-80 MBT with ERA, Crack

Platoon 1:
3 T-80 MBT, Line

Platoon 2:
2 T-80 MBT, Line
1 T-80 MBT, Green

Platoon 3:
3 T-80 MBT, Green

Elements, 1 Company Motor Rifles
Company Assets:
2 BMP-2, Line

Platoon 1:
3 BMP-2 with Dismount squads, Green

Platoon 2:
1 BMP-2 with Dismount squad, Line
1 BMP-2 with Dismount squad, Green

Elements, Dniestrian Militia
Set up in Tiraspol:
5 x Motor Rifle Squads, Green

Set up in Bendery within 5 MH of the Bendery-Tiraspol bridge:
1 x Motor Rifle Squad, Crack
2 x Motor Rifle Squad, Line

Off-board artillery support (Company-Level)
2 x Batteries, each with:

6 x 122mm D-30
Ammunition Loadout per howitzer:
HE: 30
WP: 6
Illumination: 4

Special Rules:

Smaller Scenario: For a more manageable scenario, players can scale down the size of the forces involved by reducing each company down to a single platoon and by concentrating the fighting only around the Bendery bridgehead by only using map1. The Russian and Dniestrian forces would set up within 20 MH of the bridghead, and would have to try to secure any two of the numbered objectives on that map.

Ammunition Loading: To add some randomness to the ammunition loads carried by the MBTs, and possessed by the artillery batteries, make two 0-9 rolls and subtract the sum of these rolls from the full load of ammunition carried by each tank and each howitzer. This represents depletion over the course of the fighting.

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ESTONIA - July 27, 1992

Russia will be great again.
- Richard Nixon

Delays in the withdrawl of Russian troops from within Estonian borders caused tensions to flare between the two nations, leading to sporadic clashes.

On July 27, 1992, Russian and Estonian Troops fought over the transfer of a building that had been used by the Soviet Baltic Fleet. The Russians claimed that the Estonians opened fire, trying to capture the building. The Estonians said the Russians fired first, interrupting the previously-agreed transfer of the building, and the Estonians took control of the building to prevent the Russians from looting the contents.

Scenario Outline: This scenario is intended for use with the Small Arms Combat System, and is a battle for control over a building. The Estonian Player has a squad of relatively inexperienced troops, but holds a fairly strong defensive position. The Russian player has a larger, more experienced force, but is forced to attack across open terrain before he can assault the building. This is a daytime scenario, with no wind.

The scenario is a fairly straightforward exercise in infantry assault and defence, and quite suitable as an introduction to infantry tactics.

Order of Battle

Estonian Forces:
The Estonians have captured the building, but have not had time to fortify it. They are well-stocked with ammunition and are awaiting the Russian counterattack. The Estonians must prevent the Russians from re-taking the building.

1 AK-74, Line
1 AK-74/GL, Line
1 RPK-74, Green
1 AK-74/RPG-7V with 3 HEAT rockets, Green
4 AK-74, Green

Russian Forces:
The Estonians must be forced out of the building, and the building retaken by force. The Russian player must have sole control of the building at any point in the game.

3 AK-74, Line
2 AK-74/GL, Line
2 RPK-74, Line
1 AK-74/RPG-7V with 3 HEAT rockets, Line
6 AK-74, Green

Special Rules and Variants

Larger Scenario: This scenario has been scaled down to make it easier to handle for a two-player game. The actual numbers of the forces involved are listed below, and will make for a scenario suitable for team play.

Estonian Forces:
2 x Motor Rifle Squads, Green
3 AK-74, Line

Russian Forces:
3 x Motor Rifle Squads, Line
5 AK-74, Line
1 RPK-74, Line

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ABKAZIA/GEORGIA - July 2, 1993.

Georgian forces fighting against Abkhaz secessionists suddenly found themselves cut off by an amphibious assault in their rear.(Mechanized)

The Georgian city of Sukhumi had come under heavy assault from separatist Abkhazians in 1993, and would ultimately fall to the Abkhaz forces in September. Georgian leader Eduard Schevardnaze remained in the city providing political and military leadership in the city right until the fall.

This scenario represents one of the earlier battles leading to the fall of Sukhumi, where on July 2, 1993, 600 Abkhazian paratroopers used the Gumista river to make an amphibious landing at Tamysh behind Georgian lines, cutting the Sukhumi-Ochamchiry road and encircling the Georgian forces fighting to keep Sukhumi from falling. It would take two days of fighting for the Georgians to reopen the road.

Scenario Outline: The Abkhazian paratroopers have made an amphibious landing using small boats and barges, and have moved to cut off the road. Although they were on the offensive briefly, their advance has been stalled by the stiffening resistance of the Georgians. They are now fighting over the a small village near Tamysh, and the lighter armor has been brought up to try to force a resolution.

This is a daytime scenario and there is a light wind from the east at 1 MHPT.

Setup: The Georgian player sets up first. There are limits to where certain forces may be set up as described in the order of Battle.

Order of Battle
Abkhazian Forces:
The Abkhazian forces must capture the village and establish a salient long enough for reinforcements to arrive in order to blunt a Georgian counterattack. The Abkhazian commander realizes that if his forces are overextended and fall before the coming counterattack, then the beachhead at Tamysh will be for nothing. Abkhazian forces enter on the first turn from the South edge of the map.

2 x Armored Platoon, each with:
3 x BMD-1 with Dismount Elements and Crew, Line

2 x Desant Platoons, each with:
- 3 x Desant Squads, Line
- 2 x AGS-17 and Crew, Line
- 3 x Ural 375 Trucks
- 2 x UAZ-469 Jeeps

Desant Antitank Platoon:
- 4 x UAZ-469
- 4 x AT-5 + Line Crews

Note: The armor given to the Abkhazi paratroops is primarily done for the purpose of play balance as well as making the scenario a bit more interesting in terms of a light-armored clash as opposed to a straight-up infantry-armor fight. Players wanting to give the scenario a more authentic feel should replace the Abkhazi Armored platoons with an equal number of Desant Platoons, using the above organization.

Georgian Forces:
The Georgian Forces, since they are reacting to an Abkhazian push, will set up a hasty defence with forces at hand and will obtain more forces over time. The Georgian commander realizes that he must break open the Sukhumi-Ochamchiry road quickly in order to preserve the battle at Sukhumi. Also, he has heard rumors over the radio nets that 2000 Russian troops from the 14th Army have crossed into Georgian territory from Moldova and are fighting on the side of the Abkhazis, so time is of the essence, and his forces will be very limited.

Georgian orders, therefore, are to hold the town (or recpature it, that being the case), and then drive through any Abkhazi forces towards the beachhead.

Georgian Motor Rifle Platoon (set up in town)
- 3 x BTR-80
- 3 x Motor Rifle Squads (dismount elements, Green)

Georgian Militia (set up in town)
- 5 x Militia squads
- 3 AK-47 (Green)
- 2 RPK (Green)
- 5 AK-47 (Untrained)

Arriving after 15 + (10) MT from the North edge of the map.
Motor Rifle Platoon
- 3 x BMP-2
- 3 x Motor Rifle Squads (dismount elements, Green)

Militia Units, Wheeled
- 2 x Gaz-66 Trucks, carrying
- Georgian Militia
- 10 AK-47 (Green)
- 2 RPK (Green)
- 2 AK-47/GL (Green)
- 2 AK-47/RPG-7 (Green)

10 AK-47 (Untrained)

Arriving after 30 + 2(10) MT from the North Edge of the map.

2 x Motor Rifle Platoon
3 x BMP-2
3 x Motor Rifle Squads (dismount elements, Green)

Reconnaissance Platoon, elements
4 x BRDM-2 with Green Crew
2 x BMP-2 with Green Crew

Scenario Length
The scenario is designed to be open-ended as to length, and players should agree that the scenario ends whenever one side is no longer combat-effective. Combat-effectiveness is a judgment call by the players, and the following guidelines may be used to determine if a side remains combat effective.

A combat effective unit is cohesive (i.e. still under a unified command, not broken), mobile (no mobility kills, no fatigued units), and armed (vehicles still have 1/3 of their maximum ammunition load, main weapons in working order, squads have at least 1/3 of their members uninjured). Players should tally all the combat effective units on both sides at any time after all the Georgian reinforcements arrive, and if the number of effective units (infantry squads and vehicles are each treated as one unit) on one side is more than three times the number of effective units on the other, then the weaker side is no longer effective, and the scenario ends then.

These guidelines should not be interpreted literally. For example, one side may have only armored units, while the other has only infantry remaining--the armor may still be effective even though facing down three times their number of infantry units, especially if the infantry have spent most of their antiarmor weapons. It depends on the circumstances.

The effectiveness guidelines are based upon the realities of combat, where a 3:1 advantage is typically required in order to successfully attack a defending unit. Consequently, an infantry unit reduced to less than 1/3 its complement would not be able to defend against another infantry unit and is therefore not combat effective.

PHOENIX COMMAND

Scenario: Tadzhikistan

TADZHIKISTAN - July 1, 1993

If Central Asia boils over, it will be very hard to put out the fire.
Anonymous Russian peacekeeper on the Tadzhikistan/ Afghanistan border, November 1992.

150 Tadzhik and Afghan guerillas storm across the Afghanistan border, with the Afghan 55th Infantry Division in support. (Mechanized)

In 1992 and 1993, there were many incursions across the Tadzhikistan-Afghanistan border by Tadzhik and Afghan guerillas fighting a cross-border war against the Tadzhik regime and their Russian allies. The once-secure Soviet borders were now under attack for the first time since the Second World War.

On July 1, 1993, a group of 150 guerillas stormed across the border with units of the Afghan 55th Infantry providing supporting fires. The Russian and Tadzhik border patrols engaged in two days of fierce fighting and resorted to their own artillery and helicopter gunships to drive the guerillas back across the border. This attack set the pattern for many more such incursions in the following weeks.

Scenario Outline: Guerrillas are using the artillery fire as cover to enter Tadzhikistan and seize control of the border area before pushing inwards. All that stands in their way is a border guard outpost.

This is a dusk scenario. There is a wind out of the north gusting irregularly at 2 MHPT.

Setup: The referee should give both players photocopies of the main map, and have them plan their movement on these copies. The Guerrilla troops may enter from either the southern or western edges of the maps at any time or in any order they wish. The Border Guards may send out up to two squads on patrol, but the rest of the Border Guard contingent must remain at the base.

Order of Battle:

Russian & Tadzhik Border Guards:
The border guards have come under unexpected artillery fire from within Afghanistan and realize that it is cover for an incursion by guerillas. The border guards must prevent the guerillas from overrunning the border compound.

Russian Motor Rifle Platoon, elements of 201 MRD

3 x Motor Rifle Squads, Line
3 x BTR-80

Motor Rifle Platoon Assets
1 x Plamya AGS-17

The AGS-17 is mounted atop the turret of one of the BTR-80s, in Afghanistan style. The shooter must stand exposed atop the hull of the BTR-80 to fire the AGS-17 and does not receive any protection from the BTR-80 when doing so.

Tadzhik Border Patrol

2 x Motor Rifle Squad, Line
1 x BRDM-2
3 x Gaz-66 Trucks

Tadzhik Border Patrol Assets
2 x PKM Machineguns with Line crews, dug in

Tadzhik & Afghan Guerillas:
Neutralization of the border compound is essential for subsequent operations. This means raiding the border compound and seizing control.

Guerilla Forces

1 x Command Group
1 Commander (Crack, AK-74)
1 RTO (Line, AK-74)
2 Riflemen (Line, AK-74)

2 x Machinegun Squads, Line
1 Gunner (PKM)
1 Spotter (AK-74)
1 Ammunition Carrier (AK-74)

8 X Rifle Squads, Green
12 Riflemen (AK-74)
1 Grenadier (AK-74/GL)
1 Anti-Tank (AK-74/RPG-7V w/ 3 HE rockets)
1 SAW (RPK)

Special Rules
Artillery Support: To use artillery support, players must have access to the Phoenix Command Artillery System, or God of War: Phoenix Command Mechanized Artillery and Indirect Fire Supplement.

In this scenario, the Guerrillas are able to call upon the Afghan 55th Infantry Division for fire support. This can be brought into play either through pre-planned fires or by having the Regiment stand by for the Guerrilla FO's instructions.

The Regiment is able to provide up to 4 fire missions in a game, with each fire mission counting as three shots from each gun in the battery of six, but not counting ranging shots. The Regiment is equipped with Russian D-1 152mm Howitzers.

Preplanned Fires: Preplanned fire missions are resolved by having the Guerrilla player secretly designate a target point for each fire mission and an expected Time On Target, which is the turn in which the rounds actually hit the target area. Once these are set, the Guerrilla player cannot modify them. Use the calculated target position error for for resolving Fire Mission accuracy. Preplanned fire missions are immediately Fire for Effect, with no ranging shots.

The referee then rolls for the scatter of the target hex as specified in the Advanced Accuracy rules of section 2.3 of the Artillery System rules. This will shift the aiming point of the battery's incoming fire, and all scatter of the fire will be measured off the shifted aiming point. The referee also rolls a 0-9 roll twice. The first roll is multiplied by 5 to determine how many turns the Time on Target is shifted, while the second roll is simply a high-low roll. If the second roll is 5-9, the fire mission is late. If the second roll is 0-4, the fire mission comes early.

Forward Observers: The command squad acts as FO and has the only radio link to the 55th Regiment. Their commander is able to call for fire support as normally. However, if the command squad is wiped out, all artillery support is lost. The commander has a forward observer SL of 3.

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UNSEEN ARMIES - August 13, 1993

Forget everything you ever heard about street crime.

Organized Crime in the former Soviet Union, which was forged under the oppression of the Soviet regime, was emboldened by the anarchy following Glasnost reforms, and became a major power after the final collapse of Communism in August, 1991. Now, Russian organized crime is an unseen army, wresting control of the nation away from the politicians and trafficking in drugs, weapons, and even nuclear materials.

The Russian mafia and the Russian police are fighting a hidden war, but one that is as bloody as any of the civil wars that are tearing apart the other former Soviet States. This scenario describes one clash between these two forces.

Scenario Outline:

On August 13, 1993, a group of Moslem Ingushi merchants in the Urals city of Nizhny Tagil became fed up with paying protection money to the local mobsters and fifty of the merchants engaged in bloody streetfighting. Russian racketeers managed to escape the fighting and broke into a military base and stole a tank. They then took the tank down to the fight to to put down the rebellious merchants, but were stopped by the local police and interior ministry forces.

This scenario may be played using either the Small Arms scale or the Mechanized scale. Due to the small number of units involved, and the variety of weapons brought into play, this scenario is ideal as an introduction to either rules set.

To play the scenario, PC Mechanized and the Modern Light Vehicles Supplement are required. If playing at the PCSACS scale, then PC Small Arms Combat System Rules will also be required.

Order of Battle

MAFIYA:

The criminals in this scenario have very little respect for the law. They have stolen a T-90 tank (the latest export version of the T-72/T-74 series) from a Russian military base and are

trying to drive it into an Ingush community to show the merchants what happens when protection money is not paid. However, they have run into a roadblock set up by the local police. They must break through or circumvent this roadblock.

Criminal Forces:

T-90, Line crew

(use the sheets for the T72M1 in PC Mechanized, since the performance will be nearly identical to the T-72 for the purposes of this scenario).

2 x UAZ-469 Jeeps, each carrying:

2 AK-47, Line
1 AKR, Green
1 Shotgun, sawed-off (driver)

(for the UAZ-469, the HMMWV is an acceptable substitute, as well as for civilian vehicles)

Police and Interior Ministry:

The academy never covered how to deal with situations like this. However, all of the crew have some military experience and familiarity with antitank weapons and there are active military personnel in your forces. You must capture or kill the tank (mobility kills are not acceptable) in order to stop the threat posed by the criminal elements.

Police Forces:

Police Tactical Squad, composed of:

4 AK-74, Line
2 AK-74/GL, Line
2 RPK-74, Line
Plus 4 RPG-18s distributed among the squad members

Interior Ministry Forces:

1 BRDM-2, Line Crew

1 BRDM-3, Line Crew

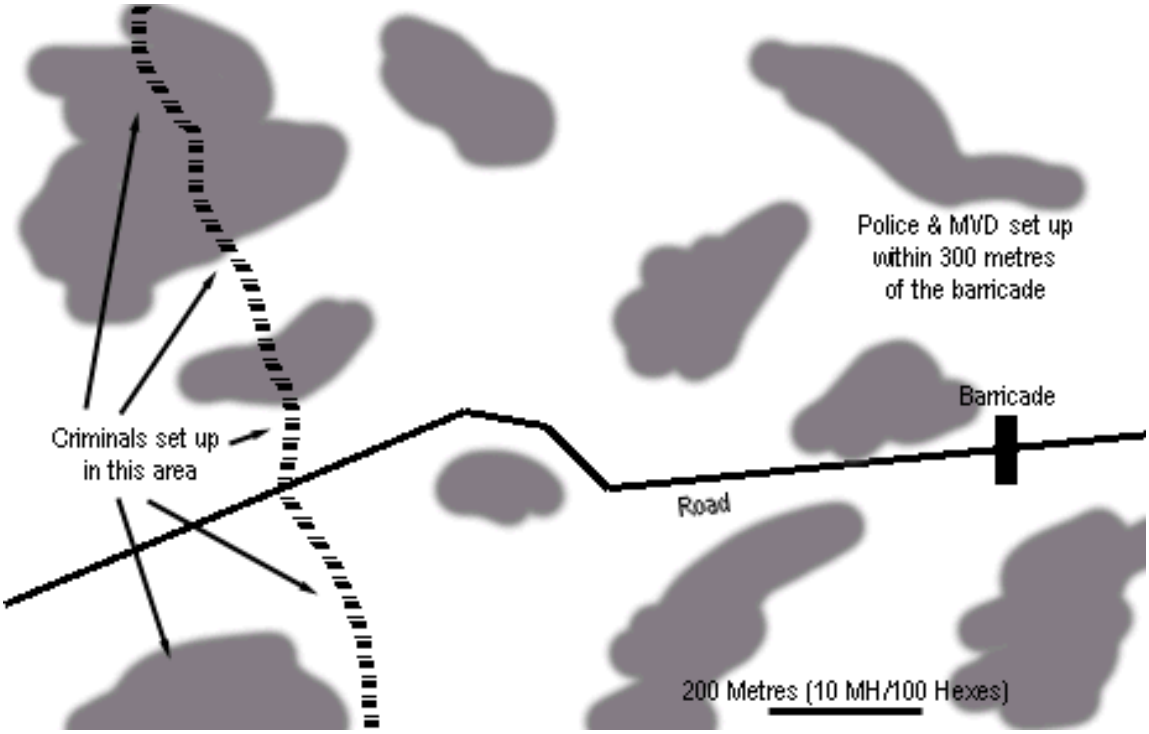
Special Rules

Barricades: The police have had the opportunity to set up a barricade from commandeered civilian vehicles, including some heavy trucks and farm machinery. This barricade is clearly marked on the map. The tank could be used to push all of these out of the way, taking 5 MT

(40 Phases) to clear a path through which the tank may pass. During the time spent pushing, the tank's movement would effectively be zero, allowing enemy forces an easier shot at the tank.

The barricade should be treated as a 40 degree incline on hard earth in the event that players simply want the tank to overrun the barricade.

Terrain: The terrain in the Urals for this scenario should be considered rough terrain--Light Rock, with a wide array of hills, all with 20 degree slopes. The only level ground in the area is the dirt road (Hard Ground, 10 degree slope on average). There are no trees, but a random scattering of brush around the landscape. Hill crests are represented by the grey areas on the map.



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Page last modified: June 18, 2000

Welcome to Hell.
-Anonymous graffiti near 'Sniper Alley,' Sarajevo

In 1992, I had completed a second scenario pack for LEG called **Welcome to Hell: War In the Balkans Scenario Pack**. The scenario pack dealt with the breakup of Yugoslavia. These traumatic events were the consequence of the fall of the Soviet Union, which saw the Warsaw Pact crumble and collapse as a wave of reform and revolution swept through Eastern Europe.

LEG ceased operations before the manuscript could be completed. Reproduced in full on these pages is the entire **Welcome to Hell** scenario pack.

INTRODUCTION

"When people ask me whom do you blame, I say give me the day and the month, and I'll tell you."
-Canadian Major-General Lewis MacKenzie, Commander UNPROFOR
Sarajevo: July 1992

The Balkan Peninsula has written much of European and even World history. The cultural diversity of the people of the Peninsula has led to substantial internal ethnic friction over time while the location of the Peninsula on the borders of Europe and Southwest Asia has meant that the region has been used as a staging area for conquerors on both borders seeking to invade and rule lands on the other side. Both internal and external belligerence gained the Balkans the title of "powderkeg of Europe," a title which has proved apt over time as irredentist and nationalist pressures have kept the region in perpetual conflict.

Now, with the removal of Communism throughout Eastern Europe and the Balkans, the people of the Balkans are beginning to find their independent political identity in the World, and this has thrown the Balkan nations into turmoil.

In Romania, a vicious dictator was removed by a popular uprising. In Yugoslavia, the old borders have been torn apart in a bloody civil war by people eager to express their nationalism. And all across the Balkans, the decades of communism have left a legacy of refugees, economic ruin, and political uncertainty. These, combined with the blood spilled in the bitter ethnic and revolutionary fighting have started the fuse on the powderkeg burning again, and while there is little risk of the keg detonating another World War, even local explosions have proved to generate terrible misery and significant international repercussions.

This scenario pack features a mix of scenarios for the Small Arms and Mechanized Combat System scenarios, allowing the supplement to be used with both.

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Page last modified: January 04, 2002

Background on the Balkans

PERSPECTIVES

God protect us from ceasefires, 'cause every time we have a ceasefire, the amount of fighting goes up.

-Canadian Major-General Lewis MacKenzie, Commander UNPROFOR Sarajevo: July 1992

The historical chronicle of the Balkan peninsula is fascinating not only for the factual record of events it encompasses, but also for the cultural and philosophical insights it provides into the current ethnic and political conflicts sweeping across the region. This section provides an overview of Balkan history and examines how that history has contributed to the current strife.

Histories of Nationalism and Irredentism

The current ethnic tensions in the region are driven by the twin forces of nationalism and irredentism. Nationalism, the desire of an ethnic group to have a nation of their own both combines and competes with irredentism, which is the concept that areas settled by an ethnic group should be ruled by that ethnic group. Balkan history is filled with instances of ethnic clashes caused by nationalist and irredentist motives.

Balkan History and Geography offer an explanation for the strength of nationalist and irredentist movements in the region. Following the collapse of the Western Roman Empire and the barbarian invasions of the Byzantine Empire in the fifth to seventh centuries, the northern Balkan peninsula was left sparsely-populated and became settled by Slav and Bulgar peoples. The first Slavs in the regions were vassals of the Avars, a Turkic people from Russia and they engaged in raiding the Byzantine empire. The Avars were defeated by the Byzantines and Slavic tribes of Serbs and Croats were invited by Byzantine Emporer Heraclius to settle in the Balkans in A.D. 626. These tribes settled in Dalmatia and present-day Serbia and Croatia. The fall of the Avars also permitted their vassals the Bulgars, a Turkic tribe, to conquer Slavs in the eastern Bal-kans. The pattern of resettlement and conquest displaced the Thracian population of Dacia and the Illyrian population of the Southern Balkans. These people would eventually become Vlachs (Romanians) and Albanians.

Over the next several centuries, the various Balkan groups engaged in empire building and were themselves the subjects of larger empires. Bulgarians and Serbs expanded their holdings until finally joined into the Ottoman empire. Bulgaria fell to the Ottomans in A.D. 1396 following political and economic destabilization from a succession crisis and Mongol raids of a century before. Serbia itself broke away from the Byzantine Empire in A.D. 1180 and began building its own empire under Stefan Dusan in 1331, eventually encompassing Albania, Epirus, Thessaly, and Bulgaria. But in 1389, the Ottoman Turks defeated the Serbs at Kosovo, fragmenting the Serbian empire into tiny holdings and all of Serbia except Montenegro was swallowed by the Ottomans. Unlike their southern neighbors, the Croatians and Dalmatians faced Frankish conquest, but would break away to form the independent

kingdom of Croatia in 925. Croatia would remain independent until a succession crisis permitted Hungarian King Ladislas I to take the throne in 1089, effectively making Croatia a province of Hungary. Hungary would also later fall under to the Ottomans in 1526, bringing all of the Balkan states under Ottoman dominion.

The geographical and cultural boundaries which had existed in the Balkan peninsula and had allowed the development of unique ethnic identities for many of the Balkan peoples were superceded by the Ottoman conquest. During the Ottoman rule, a great deal of internal migration took place as required by the dictates of the Empire and of Commerce. The internal migration served to muddy the national boundaries and provided a stong breeding ground for irredentist politics.

By the 19th Century, many Balkan nations were able to gain their modern political identity with the slow collapse of the Ottoman Empire. This brought the Balkans to the forefront of Western European concern. The strategic location of the Balkans made them important to Russia and Habsburg Austria as frontier territories, to Britain as a communications link with its far Eastern colonies, and to the Ottomans themselves, who on seeing the decline of their empire were unwilling to cede and more territory to their rivals. In the midst of the international concerns, Balkan nationalism rose to start the formation of independent states. Serbia staged an uprising in 1804-1813 that would eventually gain it autonomy in 1830, with Montenegro receiving international recognition as an independent state in 1860. The Greeks also engaged in revolution and civil war in the 1820s, gaining independence in 1830. Danubian principalities, which under the Crimean War's Treaty of Paris were to remain separate, elected Alexandru Cuza as sole prince and achieved unification in 1861 to create Romania. Bulgarian revolutionaries used the new state of Romania as a staging area to throw off the Ottomans in 1875. Albania also had an insurrection in 1909-1912, but failed to achieve independence until 1926.

By the start of World War I, the Balkan Peninsula was a region of several small states each seeking to expand their own territories while simultaneously trying to prevent powers outside of the Balkans from exerting their influence. Several major crises occurred in the period before the wars, but the most serious was the 1908 Austrian annexation of Bosnia-Hercegovina from the Turks, an action protested by all the then-independent Balkan states. Austria and Serbia almost went to war over the issue, and could have drawn in the whole of Europe as many of the treaty obligations which contributed to the expansion of World War I were already in place. Two Balkan wars would be fought before the start of the Great War. The first Balkan War (1912) removed the remnants of Turkish rule from Europe in a battle between Turkey on the one side and the nations of Serbia,

Bulgaria, Montenegro, and Greece on the other. Great Power diplomats brokered a peace unsatisfactory to Serbia and Bulgaria, and these two former allies fought each other in the Second Balkan War (1913). Serbia, Greece, and Turkey were eventually able to beat Bulgaria into submission and gained substantial territorial concessions from the defeated nation.

By the end of all of this history, the forces of nationalism and irredentism had permanently marked the face of the Balkans. Nationalism gained the Balkan nations their indepen-dence, while irredentism threw them against one another. At this point, the stage was set for the start of the Great War.

Serbia had been angered over the Bosnian annexation and so supported Serbian independence movements within Bosnia-Hercegovina. One of which, the Black Hand under the command of Serbian Colonel Dragutin Dimitrijevic, would finally start the war when their

Bosnian Serb member Gavrilo Pricip assassinated the Austrian Archduke Franz Ferdinand and his wife Sophie duchess of Hohenburg on June 28, 1914. The Powderkeg of Europe had exploded into the Great War.

Diplomatic Solutions

Following the Great War, the victorious Allied nations attempted to divide the Balkans in a way that would stabilize the region for the forseeable future. Many borders were redrawn as territor-ies were taken from central power allies and given to Entente allies. The old Austro-Hungarian empire was shattered. Transylvania was given over to Romania, and Slovenia and Croatia were surrendered to the Serbians and rearranged into Yugoslavia, the South Slav state. Greece received Western Thrace from Bulgaria and Eastern Thrace and Smyrna from Turkey. The Diplomats, in proposing this solution, failed to take into account the strong nationalism of the minorities in the South Balkans, which would lead to the Greco-Turk War, which led to a solid defeat for the expansionist Greeks.

In the rest of the Balkans, nationalism also caused interwar friction. The rise of peasantist, communist, and later fascist organizations along ethnic lines in Yugoslavia, Romania, Bulgaria, and Albania led to the collapse of parliamentary breakdowns in those nations, creating effectively authoritarian states. Rather than stabilizing the region, the rise of authoritarianism led to even more unrest.

Yugoslavia's king Alexander was assassinated in 1934 by IMRO Macedonian revolutionaries, forcing his brother Paul to take power as regent. Greece suffered repeated Coup-d'etats. King Carol II of Romania waged a covert war against Corneilu Codreanu and his Iron Guard fascists. King Boris III of Bulgaria launched a military coup which drove IMRO revolutionaries from his country.

All of these revolutionary and nationalist tensions would be stilled for the next fifty years by events transpiring far beyond the Balkan Peninsula, first by the arrival of World War II, and then by the post-war Communist governments in Albania, Bulgaria, Hungary, Romania, and Yugoslavia during the Cold War.

Repression and Consequences

It was only the repression practiced by the former Soviet Bloc nations of the Balkan Peninsula that was able to mask and control much of the existing ethnic tension and keep the region from exploding into violence from 1945. Harsh object lessons like Hungary in 1956 and Czechoslovakia in 1968 emphasized that the Soviet Union would use military force to quickly and brutally crush dissent in its European Empire, and that the national governments had the military might of Moscow at their summons to help in controlling unrest. The threat of Soviet military intervention bolstered the repression of Eastern Bloc nations and controlled the simmering ethnic friction. But then came Soviet "Perestroika" reforms, and the military threat evaporated as former Eastern Bloc nations began digging themselves out from over four decades of Communism and liberalizing their government structures. Much of the repression that had controlled ethnic tensions also disappeared, and in ethnically diverse regions such as the Balkan nations, the ethnic tensions became dangerously high.

Of course, there were governments which tried to continue their repression despite the lack of Soviet support. In Bulgaria, the slow reform process under President Todor Zhivkov tried to assimilate Bulgarian Turks, resulting in Turkish protests, police crackdowns, and a 300,000 member exodus across the Turkish border. The domestic and international censure Bulgaria

received for bringing about the exodus eventually forced Zhivkov's resignation and the liberalization of Bulgaria. In Romania, leader Nicolae Ceausescu bled his nation white of assets to attempt to repay foreign debts and forced the Romanian people through a bizarre systemization policy of destroying villages and settling the residents in urban apartment complexes. Ceausescu paraded himself as absolute leader of his nation, but when demonstrators attempting to block the arrest of Hungarian priest Laszlo Tokes were shot and killed by Securitate, Ceausescu was removed from power in a bloody week-long revolt by protestors no longer facing Soviet military intervention.

Another nation, however, found that the ethnic tensions which had been controlled by the central socialist government were strong enough to tear the nation apart. Yugoslavia in 1991 found that several of its component republics wanted independence and for a while, the central government fought to keep the nation together. Eventually, the central government itself was replaced by a Serbian command, which used the Army and irregular forces to realize Serbian territorial claims. Yugoslavia which was born out of the First World War as an amalgam of several smaller republics had disintegrated some seventy years later in a fit of irredentist bloodletting.

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Page last modified: February 09, 2001

YUGOSLAVIAN MILITARY AND PARAMILITARY FORCES

What's left of Yugoslavia...
-Popular term among western media to describe Yugoslavian disintegration.

During the war of Yugoslavian dissolution, there were several military and paramilitary forces operating within the Yugoslavian republics. These ranged from the remnants of the Federal Yugo-slavian Armed Forces to National Guard forces of the breakaway republics. As the war progressed, military forces fragmented along first ethnic, and then political lines. The war itself devolved into numerous small-unit actions and artillery bombardments. Each of the major combatants is examined below.

FEDERAL YUGOSLAVIAN AND SERBIAN FORCES

Federal Yugoslavian and Serbian Forces engaged in joint operations in 1991 and 1992 in an attempt to prevent the dissolution of Yugoslavia and to attempt to place Yugoslavia under Serbian dominion. The interoperability of these forces was based both upon the Yugoslavian military doctrine of Total National Defence and the ethnic similarity of their command. Since 1953, the officer corps and command structures of the Yugoslavian National Army had come to be dominated by Serbians and Montenegrins, while the Serbian Forces were an ethnically-organized militia. The military structures and doctrines of Yugoslavian and Serbian forces are examined below.

Army of the Republic of Yugoslavia

The Yugoslavian National Army (JNA), also known as the Yugoslavian Peoples' Army (YPA), had a unique operational doctrine for a conventional military force. Yugoslavia based its defence doctrine upon the concept of Total National Defence (TND), which drew upon Yugoslavia's rich partisan history during World War II. TND gave the JNA the role of defending borders against aggressors with the intention of delaying an invader long enough for Territorial Defence Forces (TDF) to enter the field and start wearing the invader down with partisan tactics. The entire Yugoslavian population under TND was to be engaged in armed resistance, armaments production, and civil defence. TND was believed by the Yugoslavian planners to be the best method by which a smaller nation could properly defend itself against a much stronger invader.

Ironically, the TND concept proved to be a catalyst in tearing the Yugoslavian nation apart in the bloody separatist battles of 1991 and 1992. The TDF were organized along social/political lines with each Republic, province, and commune possessing its own TDF elements. Unlike the JNA, which integrated all nationalities below the officer level, the disparate TDF elements were usually ethnically homogenous, and would form the base of nationalist resistance to the

Yugoslavian Federation.

Each TDF force was split into manouverable and spatial elements. Under TND, manouverable elements were to act as mobile partisan squads, while the smaller spatial elements protected key locations and defended the population. The battalion-sized manouverable elements were under the control of republic staffs and these were the units which formed the armies of the breakaway republics.

The JNA itself was organized under six districts, based at Belgrade, Skopje, Split, Zagreb, Sarajevo, and Ljubljana. Before the war, the JNA fielded a large force, with some 213,500 people under arms and 575,000 reservists. The TDF fielded as many as one million personnel. The JNA organization is given on the table below.

Table of Yugoslavian National Army Composition

12	Infantry Divisions
3	Mechanized Infantry Brigades
3	Motorized Infantry Brigades
3	Light Brigades
3	Mountain Brigades
8	Independent Tank Brigades
6	Artillery Regiments
6	Antitank Regiments
11	Antiaircraft Artillery Regiments
4	Antiaircraft Missile Regiments

As the war of Yugoslavian dissolution progressed, the JNA found itself being weakened, not only through the usual casualties and desertions accompanying an inter-ethic war, but also because JNA conscripts in Croatia, Slovenia, Macedonia, and Bosnia-Hercegovina refused to enter the ranks. The JNA slowly became a Serb/Montenegrin organization, and even these ethnic groups were wont to desert when they grew weary of the fighting.

Weapons and Equipment: JNA and TDF equipment consisted of material ranging in vintage from World War II to the present. Main Battle Tanks (MBTs) were primarily the older Soviet T-54/T-55 series, but the Yugoslavian State Factories were also producing the newer M-84 MBT, which was a licensed copy of the Soviet T-72M MBT (also known as the T-74). Other tanks in active service were the American M-47 Patton, and the Soviet PT-76 Light Amphibious Tank. As the war went on, World War II era T-34/85 Soviet tanks were pressed into service. Most tanks were organized into tank battalions attached to infantry divisions or regiments. Eight independent tank regiments consisting of one heavy tank battalion using M-84s and two regular tank battalions using T-55s were also fielded. Each tank battalion was organized along Soviet lines, with a headquarters tank over three companies of ten tanks each.

Armored personnel carriers were mainly locally produced BVP M80A and M60 APCs and BOV-M armored cars. Older Soviet equipment like BTR-60/-50/-40s as well as American M-3A1 halftracks and M-8 Greyhound armored cars were also in service. Soviet BRDM-2 vehicles were used for reconnaissance.

Helicopter support provided by the Yugoslavian Air Force consisted of Aerospatiale SA-341 Gazelles produced under license in Yugoslavia as the ”Partizan• and Mil Mi-8 Hip Transport helicopters. The air force also provided close air support over the combat zones with the

Yugoslav-produced Galeb/Jastreb, Kraguj, and Soko IAR-93B Orao 2 and Soviet-made MiG-21F and MiG-21U jets.

However, the Yugoslavian war was not a mobile war. Infantry and artillery ruled the battlefield, with tanks being pressed into service as self-propelled artillery. Other artillery consisted of D-30 and 2S1 (SAU-122) 122mm howitzers, M-101 105mm, and M65 and M-114 155mm Howitzers. There was a strong reliance on mortars, primarily the Soviet M-38 82mm and M-43 120mm types.

Yugoslavia also produced its own copy of the Brandt MO-120-AM50 120mm Mortar. Direct fire antitank guns included the 75mm M-1943, the 90mm M63B2, and the 100mm T-12.

JNA infantry weapons were primarily Warsaw Pact and locally-produced weapons, including AK-47s (called M-70 Zastavars) and AMD-65s assault rifles as well as the Soviet SVD sniper rifle and Tokarev TT33 (M-65) 9mm pistol. The JNA also fielded RPK (M-65B) light machineguns and relied upon the M53 SARAC (local copy of German MG-42 World War II-era MG), the German MG-3, and the Soviet PKM for heavier machineguns. Explosive infantry weapons included the local M-79 Osser 90mm rocket launcher and the M-71 LRL 128mm indirect fire rocket launcher. Yugoslavia also relied quite heavily on older recoilless artillery and anti-tank launchers in the past, but these have not had much of a profile in media reports on the fighting, leading to the assumption that many had been retired and replaced by more modern rocket and missile launchers. Recoilless launchers included the 82mm M-60PB, the 57mm M-18, and the 105mm M-65. Anti-tank missiles included the AT-1 Snapper and the AT-2/AT-3 Sagger.

Rechristening: With the formation of the Federal Yugoslavian Republic (FRY) on April 27, 1992, the JNA was renamed the Army of the Republic of Yugoslavia, and was supposed to operate only on FRY territory, theoretically preventing any Army operations in Croatia, Slovenia, Bosnia-Hercegovina, or Macedonia.

Serbian TDF

The Serbian TDF was the official military force of the Serbian republic and operated very closely with the JNA. The Serbian TDF was a militia/partisan structure under the TND concept which dominated Yugoslavian military structures for several decades and the TDF's role was to assist in the defence of Serbia against foreign invasion. However, when the Yugoslav nation began its devolution, TDF units quickly became official armies for the breakaway republics and at this time, the Serbian government obtained control of the elements comprising the Serbian TDF.

Serbian TDF weapons were identical to JNA arms, although the TDF, being oriented towards small-unit operations, would have focused on infantry weapons. Because of the closeness of the Serbian TDF and the JNA, Serbian TDF units were much better equipped and trained than other TDFs.

Serbian Irregulars

The term irregular was applied very liberally to many non-JNA units operating in Yugoslavia and often encompassed government-controlled Territorial Defence Forces. In proper use, the term "irregular" should only apply to independent paramilitary forces.

The most prominent group of irregulars in Yugoslavia was the Cetnik movement. They were a wing of Vojislav Seselj's Serbian Radical Party and operated in the partisan or marauder style, much like their World War II namesakes. The original Cetniks were nationalist Serbian partisans led by General Drazha Mihailovic fighting against Nazi German occupa¬tion. The original Cetniks were eradicated by Tito's partisans following World War II.

Although Croatians used "Cetnik" to refer to both all Serbian irregulars and as a synonym for fascists or hardcore Marxists, the Cetniks were only one group of Serbian irregulars operating in Yugoslavia. Others prominent irregulars included the White Eagles under the command of Dragoslav Bokan and the Serbian Tigers of Zeljko (Arkan) Raznatovic.

Finally, there were irregulars which claimed to be the armies defending independent Serbian republics liberated from Bosnian or Croatian territory. These included the Army of the Serbian Republic of Bosnia-Hercegovina under the command of Radovan Karadzic and General Ratko Mladic and the Army of the Serbian Republic of Krajina. All of these irregulars, because of the close Serbian ties to the JNA, operated with arms and even armor and artillery equal to those of the JNA and relied on the JNA for air support. They also fielded civilian or irregular weapons where military weapons were unavailable.

Serbian Special Force

The Serbian military announced the formation of a Special Force of 20,000 "well-trained" troops on November 7, 1991. The exact role of this force has not been reported to date, although the name suggests elite force style missions, ranging from intense partisan warfare to internal security operations. A more likely role would be as a politically reliable and militarily effective guards unit, receiving the best equipment and personnel.

SLOVENIAN FORCES

The Republic of Slovenia was the first Republic to break away from Yugoslavia, and also the first to suffer attack by JNA and Serbian troops seeking to preserve Yugoslavian ”jedenstovo” (unity). It was also the first republic to cement its independence with strong resistance and an effective and lasting ceasefire.

Slovenian TDF

The Slovenian Territorial Defence Force was organized along the same lines as other Yugoslavian TDFs, but in combat, the Slovenian TDF responded with well-trained and well-organized troops. In this sense, the Slovenian TDF was not the partisan militia that TND envisioned, but was the full-fledged republican army that Serbia feared. JNA troops in Slovenia found their ground assault facing heavy resistance, and then found their positions besieged by the Slovenian TDF.

Slovenian TDF units equipped themselves from Slovenian-based JNA and TDF armories and from weapons captured from JNA forces, so they used the same weapons and vehicles as the JNA, as well as any weapons which they were able to import from other nations.

The current Slovenian Army is now making use of JNA equipment handed over to them on the JNA withdrawl of October 25, 1992.

Slovenian and Croatian Special Forces

Given that the TDF structure did not allow for the formation of Western-style elite units, the sparse media references to Slovenian and Croatian Special Forces are a mystery. Of the two nations, Slovenia had a more professional TDF organization, so it is possible that elite units were organized from the best trained of Slovenian TDF troops to act as "palace guards" and partisan raiders, much like the Serbian Special Force (see above).

Croatian Special Forces, on the other hand, were likely Special Forces in name only, trading on the mystique surrounding elite units. Croatian "Zebras", as they called themselves, were probably little more than a splinter of Croat irregulars or ZNG units. The organization of the Croatian ZNG and the splintering of Croat resistance along political lines precluded the estab-lishment and training of traditional "elite" units.

CROATIAN FORCES

The resistance units which saw the most of the fighting in the war of Yugoslavian dissolution were the various Croatian militias. The fighting within Croatia lasted for several months and even spilled over into Serbia. Croatian units were also active in Bosnia-Hercegovina following the republic's move to independence and were instrumental in carving the state of Herzeg-Bosna out of the old borders of Bosnia-Hercegovina.

Croatian TDF/ZNG

On April 11, 1991 the Croatian Territorial Defence Force became the cadre for the Croatian National Guard Corps or ZNG. The ZNG later filled the role of the republic's army and was the main force of resistance to JNA and Serbian invasion. The ZNG came under the command of the Croatian ”Ministartvo Obrane” (Defence Ministry).

During the course of the war, the ZNG proved capable of fighting the JNA and Serbian forces to a standstill, but nothing more. The ZNG was primarily an infantry-based organization which used captured JNA weapons and artillery pieces where avail-able. Its infantry weapons were likewise primarily those of the JNA and civilian and irregular units (see below), although Croatian leaders, after scouring world arms markets, were able to procure a large amount of Ultimax 100 Squad Assault Weapons manufactured by Chartered Industries of Singapore. Other infantry weapons, primarily Soviet-designed, were imported from Hungary, Romania, and other former Eastern Bloc nations.

Armored Units: Although very rare, Croatian ZNG armor did operate in small units distributed throughout the Croatian theatre. Any armored vehicles the Croatians possessed consisted of captured JNA equipment or civilian vehicles. Tanks used by the Croatians included sparse collections of T-54/T-55 MBTs, M-84 MBTs, and whole units of T-34/85 World War II tanks. Armored Personnel Carriers included BVP M80As, M-60s, BOVs, BTR-60s, and BTR-40s, as well as civilian trucks and farm tractors which had steel plate welded on as expedient armor.

Croatian HOS and Irregulars

The political splintering of the Croatian military forces meant that there were several unofficial Croatian paramilitary forces operating as irregulars through the course of the war. The most prominent of the irregular units was the HOS, which was the military wing of the ”Hrvatska Stranka Prava” (HSP)--the Croatian Party of Rights or Croatian Party of Justice, depending on

the translation. The HSP/HOS were an extreme right-wing organization which organized and fought independently of the actions of the Croatian government and even engaged in attacks in the Republic of Serbia. Naturally, this caused a great deal of friction between the HSP/HOS and the ZNG, and Dobroslav Paraga, the HSP leader, was arrested in November 1991 on charges of trying to overthrow the Croatian government.

The HSP/HOS appeared to be a resurrection of the Ustase radical movement of World War II. The Ustase were a fascist terrorist group installed as the government of independent Croatia following Hitler's invasion of April 6, 1941. The Ustase militia terrorized the civilian population, but their most terrible crimes included the mass extermination of Orthodox Serbians and Croatian Jews with such brutality that even German and Italian officials were horrified.

HOS used weaponry similar to the ZNG, although frictions between the two organizations have probably meant that the HOS had been forced to limit itself to civilian and irregular weaponry or to cultivate other sources for its arms. HOS was primarily an infantry organization, but did use captured armored vehicles in a defensive role. HOS units engaged in both guerrilla infantry attacks on Serbian and JNA positions and villages, and also defended several village strongholds in Croatia.Üd[1]ÜŒ Croatian Specijalci and Milicija.

Many of the early clashes preceding Croatian independence occurred between Croatian ”Milicija" (police) forces and armed Serbian insurgents operating in the Serbian-dominated regions of Croatia. In response to Serbian insurrection, Croatian extremists, including those in the ruling Croatian Democratic Union (HDZ) armed themselves and the Croatian government formed a special paramilitary police reserve known as the ”Specijalici”, an internal security force. Although the ”Specijalici” were demobilized in January 1991 to forestall a crackdown by the JNA, they were not disbanded and appeared two months later at Pakrac, acting as riot police in concert with the ”Milicija”. The Croatian police forces there cracked down heavily on Serbian separatists until replaced and forced out of the fighting by JNA forces.

Croatian International Brigade

The Croatian International Brigade was an irregular Croatian infantry unit which was composed of expatriate Croatians and non-Croatian mercenaries acting as cadre for local Croatian units. In practice, the Zagreb International Brigade acted as a receiving area for "imported" troops before assigning them to disparate Croatian ZNG and ”Samb” (independent) units. The International Brigade also referred to all "imported" troops, regardless of their actual unit assignment. The Internationals were of varying quality, ranging from untrained teenagers to professional soldiers. In a sense, they were much like the mercenaries and adventurers who fought the Fascists in the Spanish Civil War.

Weapons consisted of a varying mix of civilian weapons and Croatian military weapons.

BOSNIAN FORCES

To understand the warfare in Bosnia-Hercegovina, one must be aware that there were three distinct ethnically-based forces fighting for the same land. Bosnian Muslims (Bosniaks) made up just over half of the population of Bosnia-Hercegovina, with the balance composed of Bosnian Serbs and Bosnian Croats in roughly equal numbers. The forces fighting in Bosnia are summarized below.

Serbian forces operating in Bosnia-Hercegovina included the JNA, who contributed 55,000 Bosnian-Serb troops as well as artillery and armor. The JNA forces were subordinated to the 100,000 strong Bosnian Serb Army commanded by Karadzic and Mladic, leaders of the Serbian Republic of Bosnia-Hercegovina. Serbian irregulars also joined the fighting and included the Cetniks, Krajinan Serb volunteers, White Eagles, and Serbian Tigers. Although the irregulars were not officially under the command of the Bosnian Serb Army, they did receive aid and arms from Serbia.

Croatian forces in Bosnia-Hercegovina were mainly Bosnian Croats and included the Croatian Defence Council (HVO) and the Croatian Democratic Union. HOS units were also present, and although the Croatian government denied the reports, Croatian ZNG troops were said to be present in Herzeg-Bosna and near Sarajevo.

Bosnian government forces included the 120,000-strong Bosnian TDF which is a poorly-trained and poorly-equipped militia organization, and the 70,000 strong multiethnic Bosnian Police.

Independent units included the Muslim Patriotic League and the Bosnian Green Berets, which were the military wing of the ethnically-Muslim Party of Democratic Action (SDA).

MACEDONIAN FORCES

Macedonian Armed Forces consist of the old Macedonian TDF and have been subordinate to the Macedonian government since January 1992. They have used JNA equipment turned over to them when the JNA pulled out on March 26, 1992.

Macedonia was not involved in the fighting surrounding the war of Yugoslavian dissolution and its independence came peacefully. However, the independence of Macedonia has angered Greece, and worried Bulgaria. Also, Macedonian Albanikos have started agitating for independence. So, given these factors the peacefully-born Macedonian Army will be tasked with border defence and internal security responsibilities for the forseeable future.

IRREGULAR AND CIVILIAN WEAPONS

Combatants in Yugoslavia, and especially Croatia and Bosnia-Hercegovina, used a mix of weapons from a variety of sources. Although the primary weapons were those captured from JNA forces and arsenals, several others were imported by Croatia prior to an European Community arms embargo, while others were older weapons relegated to TDF arsenals.

The most common irregulars' weapon was the Soviet-designed AK-47, and these were brought in from Hungary, Romania, and Czechoslovakia. German made G-3s and Argentinian produced FN-FAL Para Modelo IIIs were also present in quantity, and photographs showed combatants with Italian SPAS-12 shotguns, Czechoslovak-produced MGV 176 copies of the American AMD-180 submachineguns, and Soviet PPSh-43 submachineguns. Irregulars in Croatia also made extensive use of the Singaporan Ultimax 100 Squad Assault Weapon.

Civilian Weapons were pressed into military service, ranging from the new Croatian-produced HS-91 9mm submachinegun, to the World War II era Mauser Kar98K rifles. American-made hunting rifles in calibers ranging from .22 LR to Remington 7mm Magnum and beyond were used extensively when military weapons were unavailable.

On a much smaller scale, expedient firearms improvised out of steel pipe saw use in the most desperate areas. These included homemade pistols, rifles, and shotguns, including shotgun revolvers, and were as dangerous to the firer as to the tar-get. Improvised firearms have never been particularly effective when compared with modern weapons, but their danger on the battlefield should never be underestimated.

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Troubles in Yugoslavia

What is Man, that he can give so much for war, and so little for peace?
-John Masters

The war of Yugoslavian dissolution was fought in three consti-tuent republics during 1991 and 1992. An overview of the fighting in each region is given in this section.

Much of the trouble started brewing in 1990. Like other Communist nations in Eastern Europe, Yugoslavia underwent significant economic turmoil and hyperinflation as it tried to rid itself of a socialist economy. Nationalist factions within the ruling League of Communists of Yugoslavia (LCY) walked out on a January 1990 congress and so doing effectively destroyed the party. Yugoslavia's communists reorganized themselves along republican structures, giving new prominence to the local communist organizations, but without a national party leadership, there was little to check rising nationalism in all the major Yugoslavian republics and when this nationalism combined with Yugoslavians' growing distaste for the Communists led to non-communist governments being elected in four of the six republics at the next free elections.

In Slovenia, the reformed communist Party for Democratic Renewal was defeated by the DEMOS coalition of anti-communist political parties. In Croatia, the Croatian Democratic Union (HDZ) under Franjo Tjudman gained the majority in the republic's Parliament.

Bosnia-Hercegovina's communists were defeated by nationalist groups representing Muslims, Serbs, and Croats with the Muslim Party of Democratic Action gaining power. Macedonian nationalists also gained power in that republic's elections.

Only in Serbia and Montenegro did the former Communists manage to hold on to power with Slobodan Milosevic's Socialist Party of Serbia (SPS) gaining the majority of seats in Serbia. These elections were indicative of how the nation would later disintegrate from the newly re-ignited nationalist and irredentist unrest.

Following the election of the Croatian Democratic Union, Serbs within Croatia's borders staged an August 19 referendum calling for Croatian Serb autonomy. When the Croatian government declared the referendum illegal, Serbs in the Krajina region raided government armories and blocked roads and railways leading to the region. Croatian police efforts to put down the uprising met with interference from JNA and Serbian authorities. This in turn sparked HDZ extremists to arm themselves to counter the Serbian insurgency. The situation was made worse when both Croatia and Slovenia assumed command of their regional TDFs and when Slovenia staged a successful separatist referendum.

1991 started with Yugoslavia in military and constitutional crisis. A January 9 Federal Presidential order for all unauthorized forces to disarm was widely ignored. Only emergency diplomatic maneuvers averted clashes between the JNA and Croatian TDF and irregular units over the enforcement of the order. A January 10 meeting among the six republics on reorganizing the Yugoslav federation was a failure as competing visions of the nation could not be reconciled. In February, both Slovenia and Croatia emplaced secession legislation and signed a mutual defence pact against JNA intervention.

Ethnic tensions continued to rise in the region as a result of three events. In February, the Serbs in Krajina declared their secession from Croatia. Then in March, 100,000 anti-SPS protestors in Belgrade organized by the Serbian Renaissance Party's Vuk Draskovic were met with riot police and JNA troops using tanks and APCs. The violent Belgrade clashes caused a great deal of concern over the combative nature of the Milosevic government and the potential use of the JNA to settle civil disorder. Also on March 1, armed Serbs police in Pakrac in Krajina attempted to disarm their Croatian colleagues and started a riot as thousands of ethnic Serbs in the town came out to show their support. 200

Croatian ”specijalici” riot police were sent in later in the day. The next day, the JNA were deployed in Pakrac to restore order and force the Croatian special police from the area.

Fighting within Krajina would continue and grow in intensity in May. Gun battles occurred in Plitvice National Park, bombs exploded in Knin, and the JNA occupied Kijevo. May encompassed several JNA crackdowns on Croat and Serb fighting in Krajina with armored units occupying many of the villages around Knin and paratroopers relieving the Serb-besieged Kijevo. Adding to the tensions in May were the Krajina and Croatian secessionist referendums. Krajinans voted 90% to remain part of Yugoslavia, while 92.2% of Croatians voted for secession. It was on this stage of ethnic tension that Croatia and Slovenia jointly declared their independence and so started the war of Yugoslavian dissolution.

Slovenia

The formal declaration of Slovenian independence came on June 25, 1991 and brought forth an immediate call for military intervention from the Federal parliament. Two days later, almost 2,000 JNA troops were mobilized to seize border crossings on the Slovenian borders of Austria, Hungary, and Italy. After twelve hours of pushing through roadblocks and heavily armed resistance, the JNA reached and seized the crossings. The Slovenian airports were closed down and the Ljubljana airport came under JNA airstrikes. June 28th saw a brief halt to JNA activities and the implementation of a fragile European Community-brokered cease-fire, which quickly fell apart and sporadic fighting continued throughout Slovenia. The Slovenian TDF proved its effectiveness in a well-organized campaign against the JNA in which it was able to stage effective blockades of JNA troops before a second ceasefire was implemented. On July 3, the JNA began returning to its Slovenian barracks allowing an uneasy peace to settle during the summer.

Slovenia had participated in EC-sponsored talks with Croatia and the Federal Government on the island of Brioni on July 7. This called for a ceasefire and a three-month moratorium on the implementation of Slovenian and Croatian independence declarations. Three months later, on October 7, Slovenia once again declared its independence and dissociated itself from Yugoslavia. This was accepted by the Yugoslav government, who agreed to withdraw JNA troops and hand over military equipment by October 25th. Slovenia had attained its sovereignty.

Croatia

Like Slovenia, Croatia declared its independence from Yugoslavia on June 25th, 1991. Unlike Slovenia, however, the JNA fought a campaign of territorial conquest with much of the fighting revolving around protecting the Serb-dominated regions of Krajina and Slavonia.

Eastern Croatia and Krajina came under heavy conflict with JNA, Serbian irregulars, and Croatian ZNG all fighting over the same territory, despite the Brioni and the later Ohrid peace talks. The overmatched Croatian ZNG was unable to prevent a steady advance of Serb/JNA forces across Eastern Croatia and lost several villages to armored and infantry thrusts by August. The fighting also produced a significant refugee problem within Yugoslavia, with nearly 90,000 people being displaced internally and several thousand fleeing to Hungary.

By September, international pressure forced further EC-brokered ceasefire talks, but the ceasefires were unable to hold for more than a few hours. Croatians were able to regain some control over the fighting by blockading of 15 army bases, which quickly surrendered on September 15 with their equipment. That same day, the JNA bombed and shelled Ploce where Croatian forces had pillaged a naval base for weapons. On September 19, a JNA armored column also moved into Slavonia near Osijek to engage Croatian defenders in the heaviest fighting of the war and on September 22, they had gained control of Petrijna and several other towns. At this point, the JNA was suffering heavily from desertions and agreed to a ceasefire which lasted to month's end. The ceasefire gave Croatian forces the opportunity to improve their positions by moving armored units and heavy artillery into new combat positions. Most of the Croatian equipment had been captured from the surrendered JNA bases.

When the fighting began again on October 1, the Croatians were in a much better position to stall the disintegrating JNA and Serbian forces. Croatian forces fought hard to capture JNA garrisons within Croatia. In response, the Yugoslav navy blockaded and attacked the Croatian ports of Dubrovnik, Ploce, Pula, Rujeka, Sebenik, Split, and Zadar, which created severe shortages of water and electricity in those cities. A few days later, on October 8, Croatia declared its independence.

Fighting would continue in Croatia until the beginning of the new year. HOS staged attacks into Serbia (November 5,6), Vukovar fell to Serbian forces (November 17), and the JNA launched renewed offensives against Dubrovnik, Osijek, Karlovac, and Sisak (December 27) while Croatia managed to recapture parts of western Slavonia (December 20). Then, on January 3, a lasting ceasefire ended the major fighting in Croatia as the United Nations granted recognition to Slovenia and Croatia. Although the ceasefire would be sporadically and continually violated in the coming months, the war in Croatia was over. Peace was ensured by the deployment in March of a 14,000-member UN Protection Force (UNPROFOR) to the regions of Slavonia and Krajina.

Bosnia-Hercegovina

With its multiethnic population, it was only a matter of time before Bosnia-Hercegovina became the scene of bitter ethnic fighting in the war of Yugoslavian dissolution. The people of Bosnia consist primarily of Muslims but with Serbs and Croats both strongly represented in the balance. But ethnic fighting is a deceptive term, implying that there is no greater purpose to the war than killing one's neighbors. The Bosnian war was not about ethnic hatreds and the term was used only as post-facto justification. Instead, the war occurred because of a mix of irredentism and expansionism.

By January 1992, the Serbian leadership knew that Yugoslavia no longer existed except as "Greater Serbia" and their main concern then became the enlarging of Serbian lands so that they would have the biggest territory when the ashes settled. Bosnia, with its large Serbian population and borders to Krajina would have appeared the best region for a territorial war.

The Bosnian government had made legislative changes to prepare for independence in October 1991 with an independence plebiscite held on November 9-12. The people of the republic voted overwhelmingly for independence, although it was claimed that the Serb-dominated Krajna (sic) had voted 90% in favor of remaining with Yugoslavia. This split was enough to frighten the European Community from granting Bosnia-Hercegovina international recognition in January 1992, in the belief that doing so would lead to ethnic fighting. This did not prevent the Serbs from declaring the Autonomous Republic of the Serbian People of Bosnia-Hercegovina on January 9 and removing themselves from independence debates in the Bosnian government.

Tensions would increase between the three ethnic groups in Bosnia. On February 24, a bomb injured 12 people in an Odzak Croatian Cultural Center. Three days later, another bomb in Banja Luca damaged the central mosque. Tensions would rise even higher following a February 29-March 1 referendum on independence when 99.4% of the voters preferred independence. Bosnian Serbs boycotted the vote and Bosnian Serb leader Radovan Karadzic said that an independent Bosnia was unacceptable and there were several clashes between Serbs and Muslims in Sarajevo and Bosanski Brod. This did not stop Bosnian President Alija Izbetgovic from proclaiming the republic's independence on March 3.

Although diplomacy would defuse the tensions for the next few weeks, by month's end, fighting had broken out between Bosnian Serbs and Croats in Bosanski Brod and Neum. On March 27, the Serbian Republic of Bosnia-Hercegovina and its loyalty to Yugoslavia were proclaimed.

Amid intensifying fighting in April, Bosnia-Hercegovina received international recognition. The fighting occurred all across the new republic, with Serbs attempting to capture and hold territory where possible. The goal of the Serbs at this point was to open an overland corridor from Serbia to Bosanska Krajina and the Serbian Republic of Krajina in Croatia and in this they had succeeded by month's end. They captured Zvornik, Srebrenica, and Bratunac and were poised to besiege and shell Sarajevo by April 21.

The fighting in Bosnia then settled into a pattern of intense fighting broken by short-lived ceasefires as the war became a state of siege against the Bosniak and Croat citizens of Bosnia-Hercegovina. In May, the JNA forces, which had been supporting the Bosnian Serbs, had all non-Bosnian members recalled to Yugoslavia. This left 55,000 Bosnian Serb JNA members still in Bosnia and they and their equipment were assigned to the Bosnian Serb Army.

Then in June, Federal Croatian forces entered Bosnia in force to assist Bosnian Croats in expanding Croat-held territor-ies around Bosanski Brod, Mostar, and Travnik, thus creating the Croatian Community of Herzeg-Bosna. This came as a shock to the Bosnian Muslim forces who had previously considered the Croatians as allies. Instead, the Croatians seemed to be cooperating with Serbs in carving up Bosnia. The creation of Herzeg-Bosna was welcomed by Bosnian Serbs as legitimizing their territorial conquests and the creation of ethnic cantons. Muslims treated Herzeg-Bosna as illegal, but did not have the military or political assets to dispute it. Muslim control of Bosnia had by this point shrank to holding the cities of Tuzla, Zenica, Sarajevo, Visegrad, and Gorazde as well as a small pocket north of

Bihac. The rest of the nation was split between Serbs and Croats.

Fighting would continue interminably over the summer, although the establishment of a UNPROFOR base at the Sarajevo airport by Canadian and French peacekeepers to permit entry of relief flights was one moment of brightness. The UNPROFOR peacekeepers would be replaced a month later by French, Ukranian, and Egyptian forces who would continue the dispersal of relief supplies to Bosnian citizens over the coming months.

Despite the presence of UNPROFOR in Sarajevo, a lasting peace is not readily forseeable. Peace, when it comes, will have to be a diplomatic, rather than military, solution because none of the belligerents in Bosnia-Hercegovina have the military resources to create their own peace and all are on precarious political and economic footings. However, a diplomatic peace effort is also begarred by the results of the war. Both Bosnian Serbs and Croats have peace plans calling for ethnic cantonments based on the territories they have captured. Bosnian Muslims, however, who make up the majority of the population would be dispossessed under such a plan, which would legitimize Serb and Croat land grabs and the creation of as many as 1 Million Bosniak refugees. To bolster its case for cantonments, the Bosnian Serbs have been engaging in "ethnic cleansing," which involves forcibly evicting non-Serb residents from Serb-held regions, creating even more refugees.

Many of the refugees have fled to Hungary, Croatia, and Kosovo. Others remain in Bosnia, unable to leave, and ill prepared for the coming winter.

In the long term, the continued fighting in Bosnia must end. No war can continue forever. The only questions are when, and how many will have to die first. This war simply becomes another justification for Blood Vengeance in the next round of fighting.

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The Romanian Revolution

Let them hate, so long as they fear.
-Caligula

One of the largest upheavals in the Balkan region was the violent overthrow of Romania's autocratic Ceausescu regime by the democratic National Salvation Front. It marked the brutal end of the Ceausescu regime's efforts to halt the wave of reforms breaking across Eastern Europe and the end of Romania's nightmare of paranoia and oppression.

Nicolae Ceausescu, since he assumed ”de facto” power in 1965, treated Romania and its citizens as resources to be used in the furtherance of his dynasty. He placed thirty of his relatives in positions of power within Romania and built a personal fortune estimated in the millions of dollars. Along with Elena, his wife, he instituted several repressive policies which dehumanized the Romanian citizenry. Ceausescu's pet projects included the repayment of a $10.2 billion foreign debt by maximizing exports to the point of creating substantial domestic shortages of food, energy, basic necessities as well as a bizarre Systemization program, which involved forcibly relocating rural residents into apartment blocks. Elena herself instituted several repressive programs to increase Romania's birthrate, the result of which was a large number of children surrendered for adoption and an alarmingly high incidence of HIV/AIDS among children who received infected blood at birth. In order to retain power, the Ceausescus relied on the fanatical loyalty of their Securitate internal police to suppress dissent, leading to rumors of government massacres in the thousands.

It was, however, the Securitate's repression which triggered the revolution. On December 15, 1989, Protestant pastor Laszlo Tokes who had criticized the Ceausescu regime for mistreatment of his fellow ethnic Hungarians was ordered deported. The following day, a crowd gathered near Tokes' home in Timisoara to prevent the implementation of the deportation order. The Securitate Special Assignment Brigade allowed the protests to continue for a day before moving in with tanks and helicopter gunships and opening fire on the crowds. Several hundred casualties were reported in this first clash. Within days, demonstrations had spread to other towns and cities.

When Nicolae Ceausescu returned from a state visit to Iran on December 20, his immediate response was to declare a state of emergency in Timisoara. The following day, he attempted to give a speech to a government-sponsored rally in Bucharest promising wage increases but was shocked when the segments of the crowd turned on him and staged counter demonstrations. The Securitate were active later in the day, firing on demonstrators and using armored vehicles to disperse them. Similar armed clashes occurred in Arad, Brasov, Cluj, Sibiu, and Timisoara.

On December 22, it all fell apart. Ceausescu declared a national state of emergency and

ordered the army to use force to disperse the demonstrators. Defence minister Colonel-General Vasile Milea refused, and was killed by one of Ceausescu's bodyguards. After a last attempt to address the hostile crowd outside the Communist Party Central Committee building, Ceausescu and his wife fled the building by helicopter, leaving it to the demonstrators.

The revolutionaries at this time had organized themselves into the National Salvation Front and had received the backing of the Army. The Securitate, however, remained loyal to Ceausescu and counterattacked in a campaign of terrorism intended to frighten the Romanian people into submission. Heavy fighting took place in Bucharest, Sibiu, and Timisoara around hospitals, media buildings, and key government facilities.

By December 25 the revolution was all over. The Securitate threat had been largely neutralized by Army and National Salvation Front militia, although small pockets of resistance remained. The NSF was in control of the country. Finally, Nicolae and Elena Ceausescu, who had been captured late on December 22, were tried secretly on Christmas morning and then executed before a firing squad.

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Balkans and Neighbors

If there is ever another war in Europe, it will come out of some damned silly thing in the Balkans.

-Prince Otto von Bismarck (1815-1898)

The Balkans have had their borders changed so many times over the centuries that many of the present and emerging borders will continue to divide ethnic groups even as migration and warfare scatter many other ethnic groups throughout the region. The Balkans are spiderwebs of conflicting ethnic groups and historic claims.

Untangling these to the satisfaction of all is a pleasant fantasy that will never be reality. The best that can be expected is a shaky peace that will ultimately be made permanent when the ethnic ties and claims are forgotten. This section briefly explores some of the oustanding territorial claims and counterclaims of the Balkan nations and their neighbors. Although few of these claims are actual government policies, all represent the aspirations of nationalists within the region. Given the strengths of nationalist movements in the Balkans, these claims will be potential sources for future conflicts in the region.

Albania: Albania has shakily started on the road to reform after a half-century of Communist rule. In 1990, violent political demonstrations in Tirane permitted President Ramiz Alia to remove several hardline communists from power and start on democratic reforms. This was not enough to prevent 57,000 Albanian "boat people" from leaving the country for Italy from 1990 to August 1991. Italy has since stepped up aid to Albania, but this was insufficient to permit the Albanian government to prevent tragic food riots in December 1991. The Albanian relationship with Yugoslavia/Serbia is difficult as the latter is Albania's major trading partner and Albania does not want to criticize Yugoslavia too harshly. However, Albanians are greatly angered by the rough treatment of ethnic Albanians living in Kosovo and Macedonia by the Serbian-dominated Yugoslav government. Albanian minorities in Macedonia/Illiridia and Kosovo have long been agitiating for union with "Greater Albania" and have received political support from Albania.

Austria: Austria is presently suffering from a slow resurgence of neo-Nazi sentiment spearheaded by the Freedom Party (FPO), which made gains in the November 1991 regional elections on a platform of anti-immigration. The Austrians have also been flooded with Croatian refugees fleeing the fighting in their home state. Austrian territorial ambitions go back to the Hapsburghs and encompass all of Slovenia and parts of Italy surrounding Trieste, although none of these ambitions are likely to be fulfilled in the forseeable future.

Bulgaria: Bulgaria has historical claims to the whole of Macedonia, although at present Bulgarians are not pressing such claims, preferring instead to keep the Balkans stable. Bulgaria has demanded of Macedonia that the latter surrender any claims to Bulgarian Macedonian provinces as a condition for recognition. In addition, Bulgarians would like to

obtain western Thrace from Greece, but a present mutual defence pact with Greece against Turkey and potentially Macedonia would preclude this. Bulgaria also has a substantial Turkish population within its borders and this has caused ethnic strife and anti-Turk rioting between Bulgarian and Turkish populations, who have a mutual disgust for each other. The Bulgarian Communist government pursued its own anti-Turkish pogrom from 1984 to 1989, causing 300,000 Bulgarian Turks to flee to Turkey.

Croatia: Croatian nationalists have already made moves to exercise their claims to Bosnia, and if possible, they would like to have all of the former Yugoslav coast from Montenegro to Trieste.

Greece: Greece has had a running feud with Turkey for more than a century, a feud which goes back to Ottoman domination of the Balkans, and the Greco-Turk war of 1919-1922. Greece, quite simply, covets Thrace out to Constantinople, Ionia to the Dardanelles, and ”enosis” with Crete. From the Balkans, Greece would like parts of southern Albania known as Nothern Epirus and several Aegean islands. Also, Greece has been quite vocal in preventing European Community recognition of Macedonia until the latter changes its name to the Vardar Republic, presumably to forestall any Macedonian claims on Greek Salonikan territory, but also to legitimize its own claims to the whole of Macedonia.

Hungary: The Hungarian people have scattered throughout much of the Balkans and have not been treated well in the lands in which they now live. Although the government of Hungary is not interested in irredentism, Hungarian minorities in foreign lands could rise to assert their ethnicity and demand assistance from Budapest. The Hungarians in Transylvania were oppressed by Romanian "de-Maygarisation" programs, possibly as revenge for the "Maygarization of the Vlachs" practiced when Hungary ruled Transylvania. Currently, the Hungarian Transylvanians, who helped to start the 1989 revolution against Ceausescu are petitioning for their own cultural identity, a sore point between Hungary and Romania. Other Hungarians exist in concentrations in Vojvodina in northern Serbia, and the future of these people under Serbian rule has yet to be determined.

Iran and the Middle East: The tribulations of a Muslim majority in Bosnia-Hercegovina prompted Iranian spiritual leader Ali Khameni to call on all Islamic nations to assist Bosnia-Hercegovina to become an Islamic state in Europe. In August 1992, the United Nations was under pressure from several Islamic nations to provide military assistance to Bosnia-Hercegovina. The Islamic nations of the Middle East have little political interest in a distant European region fighting for independence, but the religious ties have already been tenuously used as a political hammer to increase the international influence of these nations.

Israel: Israel may offer humanitarian aid to Jews within former Yugoslavia as they did for former Soviet and Ethiopian Jews, but otherwise, Israel has no interest in the region.

Italy: Italy has no territorial claims on the Balkans, other than the Dalmatian coast of Croatia. Italy at present is content to accept its role as Balkan economic and spiritual savior, a role it filled by accepting many Albanian refugees during the summer exodus of 1991. Acting as savior would also give Italy economic dominance over the region.

Macedonia/Vardar Republic: One of the dreams of former Yugoslav leader Josef "Tito" Broz was to create a "Greater Macedonia" incorporating the traditional regions of Macedonia which were under the dominion of Bulgaria and Greece. Much of the current tension between Bulgaria, Greece, and Macedonia over Macedonia's name is based in Bulgarian and Greek fears that Macedonia may try to press its claims to "Greater Macedonia." The independence

of Macedonia in January 1992 angered Greece, which believed that the very name of Macedonia indicated a desire to press territorial claims to Salonika (Greek Macedonia). Even Bulgaria, which recognized Macedonian independence early on had concerns about territorial claims on its Macedonian provinces. These two nations have been quite vocal in preventing Macedonia from achieving international recognition, demanding that Macedonia change its name to the Vardar republic. Also, Albanikos within Macedonia had been agitating for independence and in April declared the independent republic of Iliridia in northwest Macedonia.

Romania: Romania is still pulling itself out of the tomb dug by Ceausescu and is dealing with rumors of a "false revolution" which installed anti-Ceausescu communists in power as the National Salvation Front. Presently, Romanian territorial claims encompass the former Soviet republic of Moldova, which used to be Romanian Bessarabia.

Russia and the Ukraine: The new Commonwealth of Independent States remains troubled by internal disputes and an economic nightmare left behind by the previous communist governments and its focus is on rebuilding its political and economic integri-ty. Its present concern with the Balkans centres on Romania and Moldova. Moldova, as stated above, used to be Romanian Bessarabia, but was ceded to the Soviet Union in 1940. Moldova is heavily populated with Vlach descendants who have been agitating for unification with Romania. This has upset the Russians and Ukranians living in the region, who have formed the self-proclaimed Dnestr Republic. Several skirmishes occurred between Moldovans and Dnestrians in early 1992, and peace negotiations between Russian, Ukranian, Moldovan, and Romanian diplomats have been unable to reach a peaceful resolution. More on the battles in the Dnestr republic can be found in the **Red Embers** Scenario Pack, which covers conflicts in the Commonwealth
of Independent States and former Soviet republics. Another possible area of concern is the Black Sea Fleet and other disputes between Russia and the Ukraine. If the Russian and Ukranian governments can finally settle the debate over title to the Black Sea Fleet, then there may be impacts on the other Black Sea nations like Bulgaria, Romania, and Turkey. Also, the Ukranians may turn towards the Balkans to assist their "Fellow Slavs" should such assistance be required. In fact, Ukranians have been part of the UN peacekeepers stationed in Sarajevo since August 1992.

Serbia: In the quest for Serboslavia, or Greater Serbia, Serbian nationalists have claimed Vojvodina, Kosovo, much of Croatia, all of Bosnia-Hercegovina, and bits and pieces from their Balkan neighbors, such as the Baranya region of Hungary, the Serb-dominated regions of Romania, and Independent, Bulgarian, and Greek Macedonia. At present, Serbs have their hands full trying to keep the Federated Republic of Yugoslavia together.

Slovenia: Slovenian nationalists would like to claim Trieste, as heirs of an outstanding Yugoslav claim to the area. Also, Slovenians have historical claims to the Carinthian region of Austria.

Turkey: Historically a major ruler of the Balkans, Turkey presently has its own problems with Kurdish insurgency, border and water rights arguments with Syria and Iraq, aggravating squabbles with petulant Greece, concerns about Turkish minorities in Bulgaria, rising power of Islamic fundamentalists, and Armenian ASALA terrorists. It is quite a list of problems. Only the problems with Greece, Bulgaria, and Armenia could directly impact the Balkans, although these nations might become adventurous if Turkey's attention were diverted to fighting Kurds, Syrians, or Iraqis. Greek and Bulgarian claims against Turkey have already been examined. Armenian claims go back to Ottoman military operations in Armenia from 1915 to 1923, where Armenians claimed Ottoman forces engaged in genocide, killing between

600,000 and 1 million Armenians. The Turks claim the deaths were incidental to the fighting, citing their own casualties of 2 million Turks, and the deaths were not part of a genocide program. The Armenian Secret Army for the Liberation of Armenia (ASALA) and other terrorist groups have been assassinating Turkish politicians since 1975 over the Armenian genocide.

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The Battle Begins

The decisive means for politics is violence

-Max Weber

Two days following the June 25, 1991 Slovenian declaration of independence, the Yugoslavian Army was mobilized, with columns heading for the Austrian, Italian, and Hungarian borders. The Slovenian Territorial Defence Force responded with roadbloacks and partisan-style resistance. By nightfall, the JNA had sized all border crossings, and found itself under siege in what had become a foreign land overnight. This scenario simulates one of the first battles on June 27, when the war of Yugoslavian dissolution officially began.

Scenario Outline

The Slovenians have little more than a squad of TDF and irregular troops equipped with military weapons, and with these they must prevent the JNA forces from crossing the roadblock. The TDF have used civilian vehicles as a quick roadblock, and have had a little time to prepare fighting positions, but even so, they are outnumbered and outgunned.

The two Yugoslavian infantry squads have dismounted from their personnel carriers and are preparing to assault the roadblock in what promises to be a pitched battle.

The scenario takes place in normal daylight and starts at the moment of the JNA attack

Setup

In a straightforward battle, all forces are placed on the board, with the Slovenians setting up first anywhere on the northern half of the map. The Yugoslavians enter anywhere along the southern edge.

For a more advanced scenario, the Slovenian player can declare some or all of his units hidden. In such a case, he may position the hidden units out of sight of the Yugoslavian player. He does not place these hidden units on the board, but notes their position on a piece of paper and gives this paper to the Referee. Hidden combatants can move and engage in actions normally, but are subject to spotting by the Yugoslavians.

Slovenian TDF

The Slovenian Territorial Defence Forces have managed to recover from the Yugoslavian assaults earlier this morning. The TDF units must hold the roadblock for as long as possible and prevent Yugoslavian units from passing.

Slovenian TDF Units

Number	Quality	Weapon
2	Line	AK-47 (one is sergeant)
1	Line	RPK
1	Green	RPK
4	Green	AK-47
2	Green	AK-47 & M-79 Osser
3	Militia	Shotgun

Yugoslavian Army

The Yugoslavian Army has been called on to preserve the borders of the nation, but all the soldiers know that this means crushing the secessionists. Two JNA squads of the platoon have been sweeping ahead of their armored vehicles securing roadblocks so that the column can pass safely to its objective. This obstacle

is just another roadblock which must be secured, with two sets of armed men facing each other, waiting for the killing to begin.

JNA Command Elements

Number	Quality	Weapon
1	Line	AK-47 (Lieutenant)
1	Line	SVD

Yugoslavian JNA Squad Organization -- Each Squad of Two Squads

Number	Quality	Weapon
3	Line	AK-47
1	Line	RPK

1	Line	AK-47 & M-79 Osser
3	Green	AK-47

Sidearms: The Lieutenant carries a Makarov PM pistol along with two magazines.

Special Rules

Parlay and Negotiation: As an option, the Yugoslavian player may elect to negotiate with the Slovenian player with the hopes of getting the Slovenians to either surrender the roadblock, or offering amnesty to any Slovenes who surrender to the JNA. Players who are interested in a straightforward battle should not engage in parlay.

To engage in parlay the JNA Lieutenant must advance in the open, preferably with his hands above his head, to within 10 hexes of the TDF vehicle barricade and announce his intention to parlay, taking 10 AC to do so. If the TDF player agrees to parlay, then his Sergeant must walk towards the Lieutenant until the two are in adjacent hexes.

The parlay process will take 30 phases per attempt, during which time, all troops may move and aim, but may not fire or otherwise engage in combat. The Yugoslavian may demand either the surrender of the barricade or the surrender of the Slovenian troops. During parlay, the Yugoslav Lieutenant must roll three six-sided dice per attempt. The Lieutenant must have the sum of the dice be less than the base odds of 4 plus his SL in order to succeed at the attempt, and he requires three successful attempts in order to have the Slovenians succumb to his demands. A failed roll is not necessarily fatal to the process--the process simply takes more time. However, each time the Yugoslavian Lieutenant fails his success roll, the Slovenian Sergeant makes a 0-9 roll and if the roll is greater than his SL x 2, then he breaks off the parlay and returns to the barricade.

If the Yugoslavian Lieutenant is able to make three success rolls, then he is able to convince the Slovenian sergeant to agree to his demands. If the demand was that the Slovenians surrender the barricade, then the Slovenians do so without combat and the scenario ends. If the demand was for all troops to surrender, the sergeant agrees to relay the demand to his troops. This will take another 30 phases, with each Slovenian combatant making a 0-9 roll. Any combatants whose rolls exceeded their SL will surrender and be escorted off the board by Yugoslav soldiers, requiring one Yugoslav soldier to escort three prisoners. Play is suspended during the surrender process. Then the remainder of the troops fight out the battle for the barricade.

Although it is Machiavellian behavior for combatants, neither side is obligated to honor either the request to parlay, or the parlay procedure itself. The only thing players must honor is the individual combatants' wishes to surrender.

Optional Parlay Breakdown: The parlay process is always tense and always has the potential to degenerate into combat through an accidental discharge or sudden threatening movement by one side or the other. If players wish to use this optional rule, then every 30 phases of parlay, make a 0-9 roll for each squad or squad element on the board. If the roll is higher than the SL of the most experienced combatant in that squad element, then someone in the squad has broken and may open fire. Make a 0-9 roll for every combatant in that squad

or element and if the roll is higher than 2 x a combatant's SL, then that combatant is nervous and will open fire unless saved by the sight of a more experienced combatant. If there is an experienced combatant within the nervous combatant's field of view, then make a third 0-9 roll, and this time, if the roll is higher than the more experienced combatant's SL, then the nervous combatant begins shooting at the closest enemy.

If shots have been fired, then at the end of the next phase repeat the process for each squad and combatant on the field, but this time, add 2 to each of the dice rolls. In this way, any parlay can degenerate into a full-scale firefight regardless of the commander's intentions. The parlay breakdown can be avoided by judicious placement of troops; by teaming more experienced soldiers with those less experienced, the entire unit is kept under better command control.

Optional Mechanized Support: At the start of the JNA assault on many barricades, a standard tactic was to send the armor forward to drive over and break apart the barricade. However, the JNA was quickly educated in the vulnerabilty of their expensive armored vehicles while practicing such tactics. Televised scenes of tanks ramming through barricades were quickly replaced by scenes of the same tanks brewing up and burning.

Players with the ”Phoenix Command Mechanized System” can incorporate the Yugoslavian vehicles into the scenario. The Yugoslavians will have 3 BVP M80A APCs with Line quality crews carrying three squads in the column. If this is done, double the number of Slovenians and provide the whole Slovenian force with 6 RPG-18s. Data on the BVP M80A can be simulated with data for the BMP-2.

Victory Conditions

The JNA win if they capture the roadblock without taking more than a squad of casualties, with casualties defined as combatants who are either dead or incapacitated for more than 20 minutes. The Slovenian TDF wins by preventing a JNA victory.

If the barricade was surrendered as a result of parlay, the JNA win a minor victory, having achieved their objective. In a sense, the TDF have also won a small victory, both by forcing the Yugoslavians to negotiate before combat, and in denying the Yugoslavians a pretext for escalating the conflict within Slovenia.

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Rearguard

The city of Vukovar came under siege by JNA forces on August 23, 1991 and withstood the siege for 86 days. In the end, the casualties and bombardment were too much for the Croatian defenders, and Vukovar fell to JNA and Serbian forces on November 17. In the last few days before the fall, Croatian forces were desperately attempting to regroup, leaving only rearguards to delay advancing JNA forces long enough to escape and fortify another strongpoint elsewhere.

Scenario Outline

As the scenario title suggests, this scenario concerns a desperate rearguard action by Vukovar's Croatian defenders against advancing JNA forces. This scenario takes place on the morning of November 15, two days before the fall, and allows players to simulate the bitter fighting that defines the close of a siege.

The Croatian player has a bit more than a squad of militia-class defenders who must delay or otherwise prevent the advance of larger JNA forces across the map until the main body of defenders has had time to establish a new defensive pocket. The JNA player has two squads of regulars with which to penetrate the Croatian rearguard, but he cannot afford to wait to clear them out. The JNA know that if the main body of Croatians has a chance to set up another strongpoint, then the fighting will drag on, and there will be even more casualties.

For maximum realism, use of the initiative and morale rules is recommended. Players with the ”Advanced Phoenix Command” Rules supplement may wish to incorporate leadership rules as well.

Setup

Croatians set up first anywhere on the western half of the map but can move to other positions once the scenario starts. JNA forces enter on any streets along the eastern edge of the map.

Croatian Irregulars

The Croatian irregulars have been designated a rearguard to allow a body of ZNG troops to retreat to another defensive pocket. These irregulars are little more than civilians who have taken up arms against the Serb-dominated JNA. Their reason for fighting is to protect their

homes and their city against Serb domination. Their exact orders will depend upon the Victory conditions chosen by the Croatian player, but all conditions will have them fighting to pin or delay the advancing JNA forces for a certain amount of time, and then retreating off the map.

Croatian Irregular Units

Number	Quality	Weapon
1	Line	AK-47
1	Line	MG3
1	Green	AK-47
1	Green	Ultimax 100
2	Militia	AK-47
1	Militia	Kar98G
2	Militia	Shotguns

Special Weapons: There are 4 M72A2 LAWs available to the Croatian irregulars to be distributed as the Croatian player desires.

JNA Infantry

The JNA is past the point of fighting to keep the country together. Yugoslavia died when Slovenia and Croatia separated and the war is now driven by irredentism. Currently, the JNA is dedicated to seizing Serb-dominated areas of Croatia from the ethnic Croatians.

The JNA commander is under severe time pressures and cannot afford to be delayed by a rearguard. He must strive to eliminate the Croatian rearguards and exit at least 6 of his combatants off the western edge of the map as quickly as possible.

JNA Infantry Organization -- Each Squad

Number	Quality	Weapon
2	Line	AK-47
1	Line	RPK
2	Green	AK-47 & M-79 Osser

3	Green	AK-47

Time and Victory

In a rearguard action, success is measured in time. The longer a rearguard force can delay an enemy's advance without sustaining many casualties, the more effective the rearguard tactics. That the enemy will eventually break through the rearguard line is never in question, but if the rearguard can delay the enemy long enough, then a potentially disastrous enemy advance can be blunted by allowing other defensive forces to regroup and re-establish defences.

The problem in any rearguard action is defining how long the rearguard should be in place. Many rearguard commanders are given the discretion within orders to hold as long as possible and then retreat. Other rearguard situations involve a signal to the rearguard from the main body indicating when to retreat, and still others have a prearranged time for retreat. This scenario allows the Croatian player to experiment with all of these. The choices are listed below. The Croatian player secretly writes down his choice of rearguard retreat and reveals it to the JNA player at the end of the game to determine the victory.

Discretionary Rearguard: In this option, the Croatian player has discretion as to the length of the rearguard. In short, his orders are to hold as long as possible and then retreat. Both time and casualties determine victory conditions in this option. The Croatian player must keep a count of the number of phases which have elapsed since the start of the game and he stops this count when either 6 JNA combatants have exited off the west side of the map, or when the last non-incapacitated Croatian has withdrawn off the west side. He divides this phase count by the number of casualties he suffered in the game to arrive at his delay number. If the delay number was less than or equal to 20, then the scenario is a JNA victory. If the delay number is between 20 and 40, the scenario is a draw. Only a delay number above 40 gives the Croatians the victory in this scenario.

Messenger: In this option, the Croatian player has arranged with his superior commander for a runner to be sent to notify the rearguard to retreat. Every 40 phases, the Croatian player makes a 0-9 roll. If the roll is a 0, the messenger arrives at the baseline marked on the map and moves towards the nearest Croatian position. If the Croatian commander is not there, the messenger spends 10 AC at the nearest position finding out where the commander is and then moves towards the commander. Upon reaching the commander, the messenger spends another 10 AC delivering the message to retreat and after that, he acts as an ordinary combatant. Once the retreat message has been given, the Croatians may start withdrawing from the map. Note that if the messenger is killed before giving the retreat order, then the retreat order will never be given, and the scenario for the Croatians becomes a hold at all costs situation.

Victory in this situation depends upon the arrival of the messenger. If the JNA have exited at least 6 combatants off of the western edge of the map before the retreat order is given by the messenger, then they win the scenario. Croatians win by preventing a JNA victory in this case.

Once the retreat order is given, the victory conditions change to saving the lives of the rearguard. If the Croatians are able to exit at least 7 combatants off the west edge of the map, including wounded carried by other combatants, but not counting the messenger, then they win the scenario. JNA win by preventing a Croatian victory.

Prearranged Withdrawl: With this option, the Croatian commander has agreed to attempt to delay the JNA for at least 15 minutes (450 phases) and then to retreat with as much of his force intact as possible. Victory in this option is simple: if the JNA are able to exit at least 6 combatants off the west edge of the map before the 15 minutes elapses, or are able to kill or seriously incapacitate (>500 PD) at least 8 of the Croatians, then they win the scenario. The Croatians win by preventing a JNA victory.

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Meeting Engagements

This scenario takes place at the height of the Croatian resist-ance to Serbian/JNA intervention in late 1991. At this point, the Yugoslavian civil war had degenerated into an infantry shoving match with mortar and artillery accompanyment. This scenario is typical of many of the infantry meeting engagements which took place in the villages swept under the path of the war. Players can take the roles of Croatian ZNG militia or JNA regulars contesting possession of a nameless village somewhere in Croatia.

Scenario Outline

The scenario is based around a meeting engagement in a small village between Croatian militia and Federal Yugoslavian soldiers. The Croatian player has a small force familiar with the village defences, but lacks heavy firepower and training. The Yugoslavian player fields two squads of well-trained regulars, but is faced with making an assault across defensible terrain. Ideally, this scenario can be used to introduce new players into the game by teaming them with more experienced players and letting them command an element of either Croatian or Yugoslavian forces. If a larger scenario is desired to accomodate more players, then give the ZNG a second squad, and give the JNA a third squad as well as a platoon command group consisting of a Line trooper armed with an AK-47, and a Line trooper armed with an SVD.

This scenario takes place in the early morning in mountain-ous territory near Sisak. As an option, players who want to add in atmospheric conditions can make a 0-9 roll. If the roll is from 0-2, the entire map is covered with early morning haze for a -6 Visibility ALM to all fire. Otherwise, visibility is clear.

Setup

Croatian forces hold a village area and are able to set up anywhere in the northern half of the map.

The Yugoslavian player must enter along the southern edge of the map, but may be delayed several phases, giving the Croatian player time to move to different positions should he so desire. The Yugoslavian player secretly makes a 0-5 roll and multiplies the result by 20. He writes this number on a card and places the number face-down. This is the number of phases which must pass before the Yugoslavian player can enter the map. When the required number of phases have passed, the Yugoslavian player flips the card over, showing the

number to the Croatian player, and can enter the map.

Croatian ZNG

The ”Zengee” squad has been moving forwards since before dawn to try to re-occupy a village it had to evacuate a week ago because of intense fighting. Since then, the village has been abandoned, although there are rumors of a Yugoslavian or Serbian unit moving up. The Croatian mission is to hold the village against any assault, although since the ”Zengees” only arrived a short while ago, they have not had time to make any improvements to the old defences.

Croatian ZNG Units

Number	Quality	Weapon
1	Line	FN-FAL
1	Green	MG3
3	Green	AK-47
2	Militia	Ultimax 100
2	Militia	FN-FAL

Yugoslavian JNA

The war has gone poorly for Federal Yugoslavian forces almost from the beginning, and now it has become a difficult infantry campaign in what has become to the JNA a foreign land. The war has become one of territory and casualties.

This patrol of two squads has been ordered to occupy the village. JNA reconnaissance patrols have reported the village empty, but there have been rumors of increased Croatian activity. This patrol must overcome any resistance and capture the village.

Yugoslavian JNA Squad Organization -- Each Squad

Number	Quality	Weapon
3	Line	AK-47
1	Line	RPK
1	Green	AK-47 & M-79 Osser
3	Green	AK-47

Special Terrain

Cemetary: The Cemetary is a typical Eastern European graveyard with large tombstones and crypts above the ground, mixed with patches of cement and foliage. The waist-high stone crypts have a PF of 11,000. The smaller tombstones have a PF of 6400. Both types provide waist high cover and grant a kneeling combatant full cover.

Also, because of the density of the tomb arrangement within the cemetary area, all movement is at +1 AC per hex, which assumes that combatants are either moving between or vaulting over the tombstones and crypts.

Trenches and Ditches: Two trenches were built by the previous Croatian defenders of this village and are in the north-western section of the town. These trenches are 0.5 hexes wide and several hexes long and provide waist-high cover to a standing combatant and full cover to a kneeling combatant. Because of their narrowness, movement within these trenches is at +1 AC per hex.

There are also some shallow drainage ditches running along the eastern road. These ditches are 1 foot deep, 0.5 hexes wide, and several hexes long. They do not have any effect on movement, and provide no cover to a standing or kneeling combatant other than reducing the target size of a person in them by 2. However, the ditches will provide full cover to any prone combatant. The ditches are not much, but when bullets are flying, they are better than nothing.

Church: The Catholic church building is at the south edge of the map and consists of a small chapel with a bell-tower/steeple, accessible by a ladder within the church itself. The church has brick & stucco walls (PF 400) while the steeple is simply wood and stucco (PF 6). The steeple itself sits 3 floors (30 feet) above ground level and a combatant wishing to reach the steeple must spend 20 AC climbing the ladder. The steeple floor is made of thick wood (PF 7) and has a 2 x 2 foot hole to accomodate the ladder and a long-vanished bell rope. There are 2 x 1 foot openings in all four walls of the steeple, permitting a good view of the entire town. Treat these openings as windows for spotting and firing purposes.

Victory Conditions

This scenario is a fairly straightforward infantry battle with both sides having the objective of capturing the village. The battle for the village ends by mutual consent of the players.

To score a major victory, one side must have the only non-incapacitated armed troops on the map after the JNA comes onto the map.

The battle dynamics of an infantry match may prevent a major victory in the case where neither side is willing to surrender ground and both are too spent to launch an offensive. To score a minor victory in such a case, one side must have possession of more buildings than the other. To have possession of a building for victory purposes means to have the only non-incapacitated armed combatants within the building itself. Any other result counts as a draw.

Sniper Alley Variant

In Croatia, and later in Bosnia-Hercegovina, the role of the sniper was redefined. No longer were snipers units targeting enemy forces with surgical precision, in Yugoslavia they became instruments of terror, targeting mainly civilian targets, media personnel, and relief workers. The rationale for this activity was that the presence of one side's sniper in an area was sufficient to indicate that side exerted influence over the area. Snipers took advantage of urban terrain by operating from fortified nests and multistory buildings in order to keep shooting at targets for as long as possible.

Sniper weapons in Yugoslavia were rarely ”bona fide” military sniper rifles. Hunting rifles, assault rifles, and even machine-guns were used in the sniper role. This reflected the sniper's new purpose--no longer was precision required, but only sufficient firepower to telegraph to the opposition which side actually did have control over the sniper's area of operations.

This variant allows players to take the roles of a Serbian Cetnik sniper team and a Croatian ZNG patrol meeting in a Croatian village. Again, this was a fairly common event in the war. Use the same map as the main scenario.

Cetniks (variant):

Cetniks set up inside the church, with the sniper setting up in the top floor of the steeple itself. The sniper team must kill or incapacitate as many of the of the Croatian squad as possible before pulling out, if necessary. The Line trooper with the SVD is the actual sniper, while the 2 Green combatants act as his security team.

Cetnik Units

Number	Quality	Weapon	
1	Line	SVD	(sniper)
2	Green	AK-47	

Cetnik units also have one RPG-18 disposable rocket launcher distributed as the player desires.

Sniper Nest: A double layer of sandbags have been placed around the steeple walls, giving a total PF of 48 to each steeple wall. Firing holes 2 feet by 1 foot have been cut in the steeple walls and should be treated as windows.

Croatian ZNG

The ZNG have learned about a sniper team operating in the village and are sent to eliminate it. They must capture the sniper nest itself by killing or driving off the sniper. ZNG units set up on the road on the north side of the map.

Croatian ZNG Units

Number	Quality	Weapon
2	Green	AK-47
1	Green	Ultimax 100 SAW
3	Militia	AK-47
2	Militia	Kar 98K (Mauser Bolt-actions)

Victory Conditions (variant): The Cetnik player wins the scenario if the ZNG units retreat or are unable to take the sniper nest. He also wins if he is able to exfiltrate his forces off the map and has killed or severely incapacitated (>20 Minutes) four members of the ZNG force. For each Cetnik not making it off-map alive, increase the requirement by 1, but note that at least one Cetnik must be alive and not incapacitated for the Cetniks to claim any kind of victory. So, if only one Cetnik survived the ZNG assault, at least 6 ZNG troopers would have to be dead or seriously incapacitated for the Cetniks to claim a victory. ZNG forces win if they take the sniper nest or if the sniper nest is abandoned by the Cetniks and the ZNGs have taken less casualties than the Cetniks need to have inflicted for victory.

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Crossfire

By July 1992, the Serbian and Croatian forces in Bosnia had occupied the vast majority of the country and had pushed the Bosnian Muslim defenders into a tiny defensive pocket north of Bihac and reduced the Bosnian presence in the rest of the country to holding major cities and towns, such as Sarajevo, Visegrad, Gorazde, Tuzla, and Zenica. In the following months, the Serbians besieged the Bosniak defenders by pounding the Bosniak-held communities with heavy artillery and mortar fire. Nighttime street battles raged as Serbs kept up the pressure through sniper fire and concentrated infantry attacks. This scenario allows players to participate in a nighttime infantry assault in Sarajevo by Serbians against Bosniak positions.

Scenario Outline

This scenario is based on a battle for a single intersection on the outskirts of Sarajevo. A small unit of Bosnian Green Beret defenders must slow down or even stop the advance of the Serbian infantry. The Serbian infantry squads are assaulting the square in an attempt to capture buildings held by Bosnian defenders.

This scenario takes place at night with only a full moon providing illumination, giving all combatants a spotting range of 200 hexes and a -4 ALM to all fire. The Serbs cut off the electricity to the city earlier, so all visibility within buildings is at no moon level illumination, with a 20 hex spotting range and -12 ALM to all fire.

Setup

The Bosnian Green Berets set up in the buildings surrounding the square and are allowed to set up any defences they may wish to use. These defences are detailed below. After the Green Berets have set up, the Serbian squads enter the map from the south or east edges.

All buildings around the square are two stories tall. All of the floors are identical, except that there are no exterior doors on the upper floors. These are treated as windows. The buildings are brick (PF = 370) and the Bosnians can emplace a double layer of sandbags on up to 10 walls of their choice, which adds a PF of 48 to the selected walls for a total PF of 418. Bosnians can also place up to 10 mouseholes, 10 rubble barricades, and 6 expedient mines. These are covered below in the special rules.

The fountain in the centre of the square provides cover for a kneeling combatant and has a PF of 900. The statue in the centre of the fountain provides cover for up to two combatants

standing side-by-side and has a PF of 4000. The kiosks around the square are small metal booths, with a PF of 2 for each wall.

Bosnian Green Berets

The Green Berets have taken the role of defending this part of the city and have spent a great deal of time preparing defences. This has been time well spent since the Green Berets are an independent unit and can expect no support or relief from anyone. Once the battle begins, they have only themselves to hold the square. The Green Berets must defend the intersection by either killing or driving off the Serbian attackers.

Bosnian Green Beret Units

Number	Quality	Weapon
3	Line	AK-47
1	Green	PKM
2	Green	AK-47
1	Militia	Ultimax 100
1	Militia	Shotgun
1	Militia	AMD-65

Note: The PKM gunner must always have another combatant with him to serve as a loader. Whenever the PKM fires, the loader's CA are occupied with feeding the ammunition belt into the gun and so cannot be used for anything except for spotting targets. If the loader is incapacitated or killed then he can be replaced by another combatant.

Special Weapons include 6 M72A2 LAWs to be distributed as the Bosnian player desires.

Army of the Serbian Republic of Bosnia & Hercegovina

The Bosnian Serb Army has had the city under siege for months and has been pounding it with artillery for much of that time and making occasional infantry forays. Platoon elements have been dispatched to try to take some territory in the nightly ritual of streetfighting. The Serbian troops must capture the buildings surrounding the intersection.

Bosnian Serb Units

Number	Quality	Weapons
1	Line	SVD

4	Line	AK-47
1	Line	RPK
1	Line	AK-47 & M-79 Osser
2	Green	AK-47
2	Militia	AK-47

Special Rules

The following rules are optional and can be used if both players consent. The scenario may be played without these rules.

Tracers: Tracers are special ammunition rounds with a pyrotechnic composition in the base of the bullet. The pyrotechnic chemicals are ignited when the bullet is fired and show the path of the bullet in flight. At night, tracers are a mixed blessing because they not only show where a combatant's shots are hitting, but combatants can also determine the firer's position by following the tracer's path to the source. This is why tracers are normally only used once in every three shots by experienced military personnel--the one in three is sufficient to permit tracking of automatic fire while being sparse enough to avoid revealing the shooter's position.

Rules for tracers in tracking automatic fire are given in Section 6.15 of the ”Phoenix Command Expansion”. Players without access to that supplement may simply add a +1 ALM per tracer to the next shot or burst taken at the same target in the following impulse. So for example, if a burst containing five tracers were fired, the next burst at the same target in the following impulse would receive a +5 ALM.

Combatants trying to spot tracer firing troops are able to spot both the firing and target locations of tracer fire in half the required spotting time and both locations are then considered pinned for spotting purposes. Heavy tracer fire, which is more than one tracer every three shots, is spotted in one quarter the required spotting time and the location is also pinned for spotting purposes. When fire is directed at the tracer location within the next phase, instead of using a firing at muzzle flash ALM, any fire at the location is done using a -7 ALM for firing at normal tracer, and -5 ALM for firing at heavy tracer.

Players wishing to record tracer locations should place a marker or chit in the hex where tracer was fired. Use a different marker for heavy tracer. The tracer chits remain in place for one phase and then are removed from the board.

For this scenario, both sides have access to tracer rounds and are able to use it as they wish.

Muzzle Flash: In night combat, muzzle flashes are one way in which enemy forces are spotted and targeted. Modern flash suppressors and muzzle brakes have done much to eliminate muzzle flash, but even so, most flashes still light up the night.

Muzzle flashes are automatically spotted by any combatants who have a direct line of sight to them. A quick way of determining this is to mark the muzzle flash hex with a chit or other marker and any combatants with a direct line of sight to the chit can "pin" the hex for spotting purposes. Any fire directed at the muzzle flash is done with a -10 ALM. The chits are removed at the end of the phase. Muzzle flashes within windows are assumed to be from shots fired far enough inside the room that the muzzle flash visibility will be limited. In this case, the flash is only visible to those combatants within the central 90 degree arc outside the wind-ow. Simply mark the window with a muzzle flash chit and treat the window as pinned for spotting purposes.

Building Defences

The Bosnian Green Berets have had some time to fortify the buildings surrounding the square and have installed the following improvements.

Mouseholes: Mouseholes are small gaps cut into the walls, allowing combatants to crawl through on hands and knees (+1AC). Mouseholes can be created in any interior wall, or on any wall where two buildings adjoin one another. In this scenario, Bosnian defenders can place up to ten of these. Creating a mousehole in the middle of combat is possible, but requires the use of an axe, sledgehammer, or entrenching tool. This requires 150 person-phases for a simple interior wall composed of wood, sheetrock, or plaster & lath. Obviously, the same method cannot be used for breaching brick walls. There, a 2 pound TNT charge is required and 6 phases are needed to set the charge. All Line-quality Serbian troops are assumed to carry entrenching tools.

Rubble Barricades: Barricades consisting of furniture, rubble, and barbed wire are often placed by defenders to limit or cut an attacker's route through a building. Common places where bar-ricades are placed are stairs, doors, and corridors. The barricade prevents movement beyond its location. These barricades can be cleared by troops in 450 person-phases (15 person-min-utes), during which they may come under fire from the enemy.

Mines: The Bosnian Green Berets have emplaced a series of RGD-5 grenades rigged with tripwires as expedient mines. A person walking through the tripwire would pull the grenade from a container, releasing the safety lever and igniting the fuse. The Bosnian player should give a list of the hexes where the tripwires are placed to the referee, who will reveal the location to whenever a combatant crosses through the mined hex. Rules for spotting tripwires are found in Section 9.3 of the ”Advanced Phoenix Command” Rules Supplement, but players may simply have the combatant make a Success Roll using three six-sided dice. If the total on the dice is less than the Base Odds plus the combatant's Skill Level, then the tripwire is spotted. Otherwise, the tripwire is missed. The Base Odds for spotting a tripwire are 6 for an actively searching person and 3 for an inattentive person. There is also a -2 modifier to the base odds because of the darkness.

If a mine is spotted, it can easily be disarmed by cutting the wire (6 AC), or avoided (+1 AC to movement). If the mine is not spotted, then there is a chance that the tripwire will be caught by a combatant passing through the hex. A running combat-ant has a 10% chance of triggering the tripwire, while a walking one has a 90% chance. Once triggered, the grenade explodes at the end of its arming time. Have the triggering combatant make a Success roll at Base Odds of 6 plus his SL to avoid getting tangled in the tripwire. Otherwise, he will drag the mine with him until it explodes. This explosion will occur in the same hex as the combatant.

Victory Conditions

In order to win, the Serbians must kill or incapacitate all the Bosnian defenders, or as an alternative, they must capture all the buildings surrounding the square. Bosnian defenders must prevent a Serbian victory in order to win.

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Zasjeda

”Zasjeda”, meaning ambush, was a favored military tactic in the fighting in Yugoslavia, and was used extensively by all parties. In this scenario, a group of Bosniaks plays a deadly stalking game with Bosnian Serbs.

Scenario Outline

This scenario is a bit different from the other PCCS scenarios in that it takes place over a much larger than usual map area. This allows ”Phoenix Command” players to explore fire and manoeuver tactics of small-unit combat. Chapter 7 of the ”Advanced Phoenix Command” Rules Supplement will be required to resolve the use of large-scale battlefields and group spotting rolls in this scenario.

Rules are provided for converting the scenario to a smaller map if players are interested in simply playing out the ambush, and ignoring the aspects of small-unit manoeuver.

The main scenario revolves around a Bosniak patrol which is tasked with orders to locate and ambush a Serbian column. The Bosniaks must locate the Serbians and prepare a hasty ambush to prevent the Serbians from passing. Both Bosniak and Serbian commanders will have to engage in careful planning and manoeuver in order to accomplish their missions.

The main scenario requires a referee and can be enlarged to accomodate any number of players. The Bosniak side should have a single player controlling the main ambush element and other players controlling any other elements like security teams, reconnaissance units, and so on. The Serbian side can be played by one or two players without difficulty, and can be expanded to include other players.

Players should use the Initiative, Morale, and Leadership rules of ”PCCS” and ”Advanced Phoenix Command” for maximum realism.

Setup

The Referee distributes copies of the main map to both sides, and asks them to draw in their itineraries, formations, and projected path of movement. Remember that a walking pace is roughly 1 HPP. Then the Referee resolves any spotting according to the Spotting Rules of ”Advanced Phoenix Command” (2nd Edition) Section 7.2, and if one group spots the other, then the Referee informs the spotting group and allows them to prepare alternate movement

plans. This continues until contact occurs, at which point, play is moved to a tabletop map.

The Play Map:

Although any miniature terrain system can be used to reproduce the smaller map, a system using banquet paper and colored felt-tip markers is the easiest and most accurate. Cover the playing table with a sheet of white banquet-table paper and tape the ends down to prevent curling or movement. Players may wish to have several sheets of banquet paper ready to permit simulation of harassing attacks. Then, using the felt-tip pens, draw in the major terrain features and buildings of the main map to an agreed miniatures scale on the banquet paper. Center the banquet paper map on the location of the ambushed column. At this point, players may elect to use the Cover Generation rules of ”Advanced Phoenix Command” (Second Edition) Section 7.1 to add in a variety of cover. The general terrain of the main map is Hilly for Cover Generation purposes.

When the tabletop map is completed, the ambushed player sets up first and must position his column in the centre of the map in whatever formation his unit was using. The ambushing player sets up next anywhere, provided that the ambushed player's forces would be unable to spot the ambushing combatants in their chosen locations. Combat then begins, using the instant ambush rules below.

Meeting Engagement: There may be situations where both sides spot each other and choose to engage each other immediately. In this case, reduce the conflict area down to a tabletop map. Both sides set up simultaneously in their respective positions, and must be set up in their formations. Combat then proceeds normally.

Bosniak Irregulars

Other units have reported a Serbian column moving towards a small village, and a squad of available fighters has been ordered to locate and ambush the Cetniks before they reach the village. Bosniaks start the scenario anywhere on their baseline as marked on the map.

Bosniak Irregular Units

Number	Quality	Weapon
3	Line	FN-FAL
4	Green	AK-47
1	Line	MG-3
1	Militia	Ultimax 100
3	Militia	FN-FAL
2	Militia	AK-47 & M-79 Osser

Special Equipment: The Radio-Telephone Operator (RTO) carries a Soviet R-107 Manpacked radio. Two R-126 hand radios (walkie-talkies) are also available to the Bosniak group. This equipment allows Bosniak forces to split up into at least three elements and remain in communication with each other. The hand radios have a 1100 hex range, while the manpack radio has a 2500 hex range.

Army of the Serb Republic of Bosnia & Hercegovina

The Serbians have planned a patrol sweep in the south quadrant around a village to investigate reports of Bosniak forces operating in the area. The Serbians must execute a patrol sweep throughout the area covered by the map and wait for follow-on forces at one of the Objective Rally Points (ORP), that they select on the map.

Once at the ORP, the Serbians are to provide security for a follow-on group who will secure the village, but this is beyond the scope of this scenario.

The Serbians enter from the south edge of the map.

Serbian Units

Number	Quality	Weapon
2	Line	AK-47
1	Line	RPK
1	Line	AK-47 & M-79 Osser
4	Green	AK-47

Smaller Scenario

Players not wanting to engage in a patrolling scenario may simply run the scenario as a straightforward ambush.

Instant Ambush

At the start of the ambush, the Bosniak player rolls a number from 1 to 4 for each of his troops; this is the number of combat actions that the combatant has available at the start of the ambush. The Bosniak player can use these Actions as desired, including movement and fire. During these actions, the Serbian player cannot take any actions and cannot Duck. Once the Bosniak actions have been used, the Serbian troops can react and play proceeds normally.

Squad Level Combat

As an option, players with the ”Mechanized Combat System” can play this scenario using the

system's squad combat rules. Simply split up the forces into the appropriate elements and calculate each element's firepower rating using the rules in Section 5.2. Have both sides plan their itineraries as before, and then place the squad elements on the play map. Movement proceeds on a turn by turn basis until one side spots the other or is fired upon, at which point the side's original itineraries are abandoned and combat proceeds using the ”PCMCS” squad Combat rules on Section 5.3.

Victory

For the main scenario, the Serbians claim a victory if they are able to reach their ORP with more than 75% of their force. Bosniaks win by preventing a Serbian Victory. In the smaller scenario, the Bosniaks win if they are able to kill or capture all of the Serbs. The Serbs win a minor victory if any troops survive, and they win a Major Victory if they either hold the field or withdraw while inflicting more casualties to the Bosniaks than they take.

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Scenario: Pears on Poplars

Pears on Poplar Trees

[Reform will come to Romania] when pears grow on poplars.
-Nicolae Ceausescu

A great deal of heavy fighting in Romania occurred in urban centres including as Arad, Brasov, Cluj, Iasi, Ploiesti, Sibiu, Tirgoviste, and Timisoara. This was where the Securitate chose to hold its battles, fighting to protect government facilities at first, and later shifting its attacks to terrorism to desta-bilize the National Salvation Front. The heaviest fighting occurred in the capital of Bucharest, where the NSF and Securitate contested the possession of government buildings in vicious streetfighting. The Securitate emerged from secret tunnels to recapture several key buildings but found themselves under siege by the Army and Romanian revolutionaries.

A state coup cannot be recognized.
-Nicolae Ceausescu

This scenario takes place on December 23, 1989, during the height of the fighting in Bucharest. A new reality has come to Ceausescu's government and Securitate, a reality where pears do grow on poplar trees.

Scenario Outline

On December 23, 1989, Ceausescu himself had fled, leaving the Securitate to defend what was left of his government. This they did by turning the Bucharest government buildings into interconnected fortresses through a secret tunnel network connecting the Presidential palace with other key buildings. The Securitate has waited out the initial assault in the tunnels, and has emerged to recapture the buildings.

The scenario itself is in three stages. It starts when the Securitate emerge from the tunnels of the key buildings and attempt to secure the buildings around the square. The second stage occurs when the Securitate have secured the buildings and consists of attacks on the troops and civilians in the square. The final stage involves successfully resisting any counter-attacks.

Both the Securitate and the National Salvation Front (NSF) are heavily armed with substantial forces, filling out both their ranks and making this a very brutal scenario. Because of the large numbers of combatants involved, team play with a referee is recommended. Play with the Initiative and Morale rules is also strongly recommended for maximum realism.

Setup

The NSF player sets up the Garrison inside the buildings as desired and the Reinforcement troops in the square. The Securitate player does not set up on the map, but has his troops in the connecting tunnels. He must designate which troops will enter the map through which

tunnel entrance.

National Salvation Front

The National Salvation Front had just organized itself yesterday and has welcomed the Army to its ranks. Many of the government buildings had been captured earlier with only light resistance encountered. But now that the Securitate are flooding out of these captured buildings, the NSF answers one question but is faced with two others. It now knows that the Securitate did not give more resistance earlier because they were in hiding, preparing a counterattack. But where were they hiding, and how does the NSF beat them back now?

The initial Securitate battles will be in the buildings themselves and soldiers in the Garrison are first line of defence. The Garrison must prevent the Securitate from capturing the buildings. Failing that, the Garrison must escape the buildings to join with the Reinforcement troops both to usher the civilians out of the square and to stage a counterattack. All of the buildings must be recaptured.

National Salvation Front—Garrison

1 Rifle Platoon, containing:

3 Rifle Squads -- Organization is below.

1 Platoon Command Group -- Organization is below.

National Salvation Front—Reinforcements

1 Rifle Company, containing:

9 Rifle Squads organized into 3 Platoons -- Organization is below.

3 Platoon Command Groups -- Organization is below.

1 Company Command Group -- Organization is below.

Romanian Rifle Squad Organization

Number	Quality	Weapons
2	Line	AK-47
1	Line	RPK
1	Line	AK-47/RPG-7V
4	Green	AK-47

Romanian Rifle Platoon Command Group Organization

Number	Quality	Weapons
1	Line	AK-47
1	Line	SVD

Romanian Rifle Company Command Group Organization

Number	Quality	Weapons
1	Crack	AK-47
2	Line	AK-47
1	Line	RPK

Securitate

The Securitate were always prepared for a military coup against Ceausescu. They hid weapons, equipment, and facilities waiting for the attempted ouster but now they are facing down the entire country in a revolution. The old tactics of holding government structures may not apply, but they are the only tactics possible. The Securitate start in the tunnels and must recapture the buildings to use as fighting positions against the troops in the square. If a building cannot be captured, ignore it and divert the resources to others--the building can always be captured later. Once the buildings are secured, the troops in the square must be attacked and neutralized with Securitate in each building contributing to a crossfire. Then, the buildings must be held against any further attacks, or failing that, the Securitate must escape with their units intact.

Securitate Units

1 Special Assignment Company, containing:

9 Squads organized into 3 Platoons -- Organization is below.

3 Platoon Command Groups -- Organization is below.

1 Company Command Group -- Organization is below.

Securitate Special Assignment Squad Organization

Number	Quality	Weapon
2	Crack	AK-47
3	Crack	AMD-65
1	Crack	AK-47/RPG-7V

Securitate Special Assignment Platoon Command Group

Number	Quality	Weapon
1	Elite	AK-47
1	Crack	RPK

Securitate Special Assignment Company Command Group

Number	Quality	Weapon
1	Elite	AK-47
1	Crack	RPK
2	Crack	AMD-65

Civilian Securitate Operatives

Number	Quality	Weapon
2	Line	AK-47
3	Line	AMD-65
2	Line	Shotguns
4	Green	AMD-65
2	Green	Shotguns

Special Rules

Terrain: The buildings are all mass-construct stone with thick alls (PF 6400). Interior walls are simple plaster and lath, for PF of 2. The floors are typical with an assortment of offices and cubicles. All buildings have three floors and a basement, each identical except that doors on the upper floors are considered windows.

Fountains in the square are 2 feet high and provide protection to kneeling combatants while the statuary in the square, provide cover to as many as two standing combatants. The fountains have a PF of 900, while the statuary has a PF of 4000.

Tunnels: There are tunnel entrances inside the basement of each key building. Each basement is identical to the floors above the ground but has no windows or exterior doors.

The tunnel is wide enough to allow two combatants to exit simultaneously side by side. The NSF does not know about these tunnels and so cannot react to the presence of the Securitate until the Securitate are spotted by the Garrison or shots are fired within the building. The NSF cannot make use of the tunnels themselves.

Reinforcement Reaction Time: The Reinforcements are stationed in the square outside the buildings and so must first hear the shots inside before they can start the reaction process. It will take 9+(6) phases for the Reinforcements to realize that the shots they are hearing are an actual battle and not Romanians celebrating by firing their guns in the air. The Reinforcements can do nothing until the reaction time ends or the Securitate open fire on them, at which point they can move and engage in combat normally.

Civilians: The civilians present an obstacle for the Securitate and NSF Reinforcements. There are 80 civilians randomly placed throughout the square, celebrating the flight of Ceausescu. These civilians will not react to gunfire until (6) phases after either the Reinforcements open fire or the Securitate opens fire on the reinforcements. Once the reaction time has elapsed, the civilians will start to run at 4 HPP towards the nearest map edge, and all actions for NSF Reinforcements within 2 hexes of a civilian at this time will be at +1 AC, representing the time spent shouting orders to civilians and trying to avoid endangering them.

The civilians represent an obstacle for the Securitate as well because the Securitate must pick out NSF Reinforcement targets among the throng. Players with access to the ”Phoenix Command Expansion” should use the target identification rules of Section 6.13 to determine which targets are NSF and not permit Securitate to open fire until the target is identified. This target identification rule applies only to NSF troops within 2 hexes of a civilian. The Securitate had no compunctions about shooting unarmed civilians and often did. The simple fact of the matter is that the Securitate realize that in this situation with limited ammunition, it is more effective to shoot an armed soldier than an unarmed civilian.

Combat Engineering: Once the Securitate have captured a building, they can designate certain combatants for combat engineering tasks, such as building

barricades, mouseholing, and planting grenade mines. The rules on the combat effects of these devices are found in the scenario “Crossfire” in this supplement.

Building these devices requires the following amounts of time: Rubble Barricades require 120 AC with up to 8 combatants contributing CA while Grenade mines require 60 AC with up to 2 combatants contributing CA.

Smaller Scenario: This is a very big scenario with a large number of combatants. There are 77 Securitate, 108 National Salvation Front Soldiers, and 80 civilians involved in the fight and this may be much more than players would want to handle at a time. Reducing the size of the forces to a more manageable size is simple. Remove 4 Securitate squads from play and take out one Garrison squad, 3 Reinforcement Squads, and 1 Reinforcement Platoon Command group. Also reduce the number of civilians by half. This will reduce the scenario to a more manageable size.

For a still smaller scenario, remove 6 squads from the Securitate, 14 soldiers from the Garrison, and 5 squads and 1 command group from the Reinforcements. Reduce the number of civilians down to 20, and close down all buildings except for one which is determined by mutual consent of all the players. None of the other buildings may be entered by any combatants, but may be used for cover. This way, the scenario becomes a simple building assault/counterassault and is quite manageable for two players.

Armored Reinforcement: Players with the ”Mechanized Combat System” can at their option provide the NSF Reinforcements with 3 T-55 MBTs with Green quality crews. These provide a form of mobile artillery for bombarding Securitate positions and were used in the actual battle for this very purpose. Also, one of the reinforcement infantry platoons should be mechanized, having 3 TAB-77 APCs. Use BTR-70 statistics for the TAB-77. The vehicles may set up anywhere within the square.

If these vehicles are introduced into the scenario, provide the Securitate with 20 RPG-18s and 12 RKG-3M Antitank Grenades to be distributed as the Securitate player desires.

Scenario Length

To keep the scenario manageable and realistic, the scenario should last for a maximum of one hour of game time (1800 phases). Within one hour of the battle's start, more reinforcements will be arriving from the rest of the city and the scenario will be reduced to a siege with both sides trying to weaken the other to gain a small advantage. Both sides will be trapped, unable to leave the battle area until events elsewhere force the battle to a close. This is what happened in the real battle. It took overwhelming force and the death of Ceausescu to finally break the Securitate threat in Bucharest, although scattered snipers and pockets of loyalists remained in combat until near the year's end.

Victory

The unusual three-stage nature of this scenario gives rise to some complex victory conditions. The Securitate plan is what is driving this scenario and this plan requires that the Securitate meet certain objectives.

The first objective is obviously capturing the key buildings. This has to be accomplished quickly and with a minimum of casualties so that more combatants are available to participate in the other objectives. If the Securitate is able to capture the majority of key buildings by eliminating or driving out all the NSF Garrison defenders, they win this battle.

If the first objective is met, the next objective is to take the square by eliminating the defenders and driving off the civilians. This is much more difficult due to the larger forces involved and the Securitate often fighting from fixed positions. If the Securitate are able to kill, incapacitate, and drive off the NSF reinforcement units and civilians from the square itself, then they have won this battle as well.

The third objective is somewhat muddled because it represents the Securitate realizing the exact nature of their victory: they have captured the buildings and succeeding in placing themselves under siege. The buildings are territory only and possess no command or government significance. The Securitate therefore have three options. The first is to drive away all NSF units off the map through an all-out assault. The second is to continue to hold the building against the next assault, if any. The final option is to designate rearguards while the rest of the unit exfiltrates overland off the map. More than 50% of the original Securitate members must exfiltrate for a victory if this option is chosen. If the Securitate are able to achieve any of these objectives, then they have won this battle as well, and have won the scenario.

It is not enough to say that the NSF wins the scenario by frustrating the plans of the Securitate and preventing them from achieving their objectives. If the NSF can frustrate the Securitate's plans in the first two stages so that the later stages never occur, then the NSF has won the scenario. Should the third stage of the battle occur, then the NSF has the following two objectives: recapturing the buildings and neutralizing the Securitate through death or capture. If the NSF can meet both of these later objectives, then they have won this scenario.

If the one-hour time limit expires before the battle's scenario's third stage is resolved, then the battle is a draw.

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Favoring the Criminal

"On the basis of the actions of the members of the Ceausescu family, we condemn the two of you to death."
-Sentence following the Verdict of Genocide in the Ceausescu trial

Ceausescu's reign ended at 1:00 PM on December 22, 1989, with his flight from the Communist Party Central Committee Building after a final attempt to address a hostile crowd of demonstrators. Angered, the crowd broke into the building, forcing the Ceausescus to be airlifted out by helicopter from the roof, even as the demonstrators emerged onto the roof in pursuit. The helicopter landed at the Boteni airbase, and the Ceausescus commandeered a car from the base. When the first car broke down, a second was obtained, and they proceeded to an agricultural station. There, they were arrested and moved to military barracks at Tirgoviste to await trial.

On December 25, Christmas day, Nicolae and Elena Ceausescu were brought before a military tribunal facing charges of genocide, corruption, and the destruction of the national economy. They remained defiant throughout the trial, refusing to recognize the jurisdiction of the court, even as the verdict and sentence of death were read. They, they were taken out and shot. National Salvation Front-held Romanian television repeated-ly broadcast images of the trial and the corpses. Nicolae Ceausescu, the Criminal, was dead.

I am not a defendant. I am President of Romania and the Commander in Chief of the armed forces. I refuse to recognize this court.
-Nicolae Ceausescu, response to verdict.

The evening before the trial, the Securitate attacked the barracks where the Ceausescus were held, possibly as part of a failed rescue attempt. Their actions encouraged the NSF to hasten the trial and execution of the Ceausescus, because they knew that Nicolae and Elena Ceausescu, if freed, would stiffen the resolve of the Securitate and spill more blood throughout Romania. The trial and execution marked the turning point of the revolution by breaking the resistance of the Securitate. With the Criminal dead, many Securitate saw no more reason to continue fighting, and so began surrendering. Later, these Securitate would face criminal charges, the most common of which was Favoring the Criminal--supporting Ceausescu.

Scenario Outline

We want to die together.
-Elena Ceausescu, final words

This scenario allows players to take part in the Securitate rescue mission on Christmas Eve of 1989. The Securitate player has skilled troops and better equipment, while the Romanian Army player has numbers and reinforcements which might be brought into play. Because of the unusual nature of the scenario, play with a referee is recommended but not required.

The scenario takes place at night in the Tirgoviste military barracks, with the only illumination provided by electric streetlights, giving dusk-level illumination (-2 ALM) to the camp and the surrounding 10 hexes of the perimeter. Outside of that range, there is no moon level illumination (-12 ALM). There is a medium wind (5 HPP) blowing from the West. Lights in all

build-ings are on, giving full illumination inside. Interior lighting can be shut off by any combatant standing in a doorway or adjacent hex and using 1 AC.

Setup

The antichrist is dead. He died too easily."
-Anonymous Romanians speaking on the Ceausescu

The Army player sets up his initial forces first and designates any patrol routes that are to be followed. These patrol routes may be abandoned once the shooting starts, but otherwise must be followed by the patrolling guards at a Walking pace of 1 Hex per Phase. The Army player also secretly designates the room where the Ceausescus are held on a copy of the map and hands this to the referee. The Ceausescus must be guarded by at least two combatants at all times.

The Securitate player does not set up his combatants on the map, but instead plots out his movement each phase on a copy of the main map and hands this to the Referee, who checks to see if any of the Securitate combatants have been spotted, or if they have discovered the room where the Ceausescus are held. Once spotted, Securitate combatants are placed onto the main map and remain on it for the rest of the game. Securitate combatants may enter the map from any one side they wish.

Army

The Romanian Army has recently switched sides to support the National Salvation Front against the hated Ceausescu regime. Nicolae and Elena Ceausescu are held on the Army base, and the Army's mission is to guard them and prevent their escape or rescue by the Securitate. This task is taken very seriously—if the Ceausescus were to escape, the Securitate would continue their terror campaign indefinitely while the Ceausescus would become rich exiles like Amin, Marcos, and Duvalier. Romania would bleed to death.

After gunfire, explosions, or shouts of alarm are heard throughout the camp, the Romanian Army player is able to receive reinforcements. These reinforcements consist of up to four rifle squads which arrive from the barracks baseline. A 0-9 roll is made once every twenty phases. On a roll of 0, two squads arrive, and on a roll of 1, only one squad arrives. Otherwise, no squads arrive. This continues until the game ends or a total of four squads have arrived.

Romanian Army Initial Units

2 Rifle Squads -- Organization is below

Romanian Rifle Squad Organization -- Each Squad

Number	Quality	Weapons
2	Line	AK-47
1	Line	AK-47/RPG-7V
1	Green	RPK
4	Green	AK-47

Securitate

The Securitate have learned from their informers that Nicolae and Elena Ceausescu are being held in the barracks at Tirgoviste. The local Securitate group of the Special Assignments Brigade has dispatched an elite hostage rescue team to recover the Ceausescus. The Ceausescu's rescue is paramount--they must be recovered alive and unharmed for the government of Romania to put down the rebellion. The Ceausescus rescue will symbolize to the National Salvation Front that the Securitate and Ceausescu can never be defeated.

Securitate units must search through the barracks area to locate the Ceausescus, free them, and then exfiltrate them from the area. Wounded must also be recovered if possible, but dead may be left behind.

Securitate Units

Number	Quality	Weapon
3	Elite	AK-47
6	Crack	AMD-65
5	Line	AMD-65

Securitate also have 6 RPG-18s which may be distributed among the troops as the player desires. Securitate also wear Titanium/Nylon Composite Body Armor (PF 6, BPF 3) vests.

Special Rules

Securitate Weapons: The Securitate were always equipped with the best of equipment. Therefore, Securitate combatants and are allowed to carry up to four special-purpose hand grenades in addition to their normal grenade load. These special-purpose grenades can be flash and stun grenades, tear gas grenades, or smoke grenades. Two special purpose grenades can be exchanged for one MON-50 directional mine, the Soviet copy of the US M-18A1 Claymore mine. Use the M-18A1 as a proxy for the MON-50.

Rules for Claymores, Flash and Stun grenades, and tear gas grenades are in the ”Special Weapons WDS” as are rules for smoke grenades. Smoke grenade rules are also found in the ”Advanced Phoenix Command” Rules Supplement.

Night Vision Devices and Illumination: There are ten lampposts providing dusk-level illumination to the base. Securitate can attempt to shoot out the lights on the lampposts; each light has a TS ALM of -4 and is destroyed on being hit. Each light that is destroyed reduces the visibility ALM by 1. When all are eliminated, the visibility on the base will be reduced to no moon level darkness. Interior building lights will still provide illumination inside of buildings and within 1 hex of unshuttered windows.

The darkness may be offset in a number of ways. The Securitate possess passive night-vision goggles, which allow unlimited dusk-level visibility across the board (-2 Visibility ALM). These goggles must be removed from the user's eyes (3 AC to remove, 12 AC to replace) before entering a lighted room or the goggles will "bloom out" from too much light, effectively blinding the wearer for as long as he wears the goggles (-14 Visibility ALM).

A second way to offset the darkness involves using two spotlights mounted on the guard towers. Each will illuminate a moveable 10 hex-radius circle to dusk-level darkness and will cause "blooming" in any night vision devices looking into the spotlights. These spotlights can be switched on in 2 AC and moving them requires a user's full attention, so no aiming or movement can be done while operating them. They have a TS ALM of -4 and are destroyed by a single hit.

The final way to offset the darkness involves the use of parachute flares. Each flare is handheld and propelled by a small rocket motor to a height of 210 metres where a small parachute flare is ejected to burn for 15 Phases. Each flare launched will increase the visibility ALM of the entire map by 4 up to but not exceeding dusk-level darkness. So if the visibility ALM for the base had been reduced to -5 by having 3 lampposts destroyed by the Securitate, a parachute flare would normally increase the base visibility ALM by 4 to a -1, but since the maximum visibil-ity ALM for the base is -2, the flare only increases visibility to -2. Each squad commander possesses two of these flares and arming and firing one flare requires 8 AC.

The Ceausescus: Nicolae and Elena Ceausescu are treated as Militia level civilians. Once they are found by the Securitate, they may be controlled by the Securitate player. They are unarmed, unarmored, and handcuffed when found. Removing the handcuffs requires 8 AC with a standard handcuff key, carried by all Securitate combatants in their pockets.

Squad Morale: The Army reinforcement squads which may arrive following the start of combat are relatively inexperienced groups who have no desire to face down elite Securitate units. When three of the squad members have been incapacitated or killed, the squad will refuse to advance any further and will take up stationary fighting positions nearby. At least one squad member will be designated to recover the wounded and get them under cover while the remainder of the squad continues to fight. As the bodies are brought under cover, one active member must stay with each incapacitated member to provide basic medical care.

Guard Towers: The one guard tower is three stories (30 feet) tall and has a simple ladder to reach the guard platform. If the army player chooses to man the guard tower, then there must be two combatants in there. One combatant will aim and fire a pintle-mounted PKM (+5 ALM). The PKM gunner must always have another combatant with him to serve as a loader. Whenever the PKM fires, the loader's CA are occupied with feeding the ammunition belt into the gun and so cannot be used for anything else, except for spotting targets. If the loader is killed, then he can be replaced by any other combatant.

Victory

The Securitate win the scenario if they are able to get the Ceausescus off the map alive and unharmed. The Army wins if they prevent a Securitate victory.

Nicolae and Elena Ceausescu are not loved at all by the Army, and the Army player may be sorely tempted to kill the two of them when the shooting starts as a means of denying victory to the Securitate. There is nothing in the rules to prevent this, but the Army player should realize that doing so would lead to a substantial political loss to the National Salvation Front. As a guideline, if the Ceausescus are handcuffed and can be considered still in custody of the Army, the Army is not allowed to shoot them until after the trial. However, if the Ceausescus are considered escaping or have been freed by the Securitate, then they are valid targets and may be shot without hesitation. Of course, the Army victory would be so much sweeter if the Ceausescus were to be recaptured alive to stand trial, as they did in real life. Therefore, in the event that the Ceausescus do not survive the game and are shot by the Army while escaping, the game is a draw whereas if they are shot by the Army while still in custody, the Army loses.

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The **Russian Roulette** and **In the Name of God** scenario packs were originally part of a much larger work called **Phoenix Command: Low Intensity Conflict**, which included scenarios from a number of wars raging in 1990-91, including Canada, El Salvador, Sri Lanka, and Liberia, in addition to the scenario packs on Russia and Israel.

What follows are the scenarios that arose from Liberia, which underwent a brutal civil/tribal war in 1990 that saw the death of President Samuel Doe and the collapse of the nation into anarchy. Despite the strong historical ties to the United States, Liberia's 1990 civil war saw little airplay on American or even world media at the time as journalists subscribed to the theory of "MEGO" - "My Eyes Glaze Over." A war in a tiny country on the coast of Africa was deemed to mean little to viewers or readers, and so it received almost no airtime or ink in the press.

INTRODUCTION

There are always wars happening somewhere. The 1990's, which began with the end of the Cold War, saw dozens of other wars which raged in the early part of the decade. Usually, each war involved a disaffected ethnic or political minority group taking up arms against its government, which responded in kind.

The proper term for these situations is low-intensity conflict. This term is used because life in the affected nations somehow continues as before, interrupted only by brief flashes of chaos. The rest of the world takes no notice of the uprising, save for when the war interrupts trade or refugees spill over into a neighbouring country. It is quite a different style of warfare from high-intensity conflict characterized by extensive use of armoured forces, supporting artillery, and aircraft, such as the 1990-1991 Persian Gulf War.

In one Low Intensity Conflict in 1990, Liberia suffered a revolution which saw the repressive regime of Samuel Doe removed and replaced by that of ECOWAS-supported Amos Sawyer. In the process, atrocities against civilians were practiced by both sides--the nation's traditional tribal animosities operated to encourage wholesale slaughter of innocents. Also, the revolution destroyed what was left of an economy ravaged by international depression and Doe's financial policies. Liberia's revolution has shattered the oldest African republic and it will be a long time before the nation will be able to recover from Doe and his overthrow.

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Background to Liberia's War

Liberia has a unique history among African states. It was originally established as a colony by the philanthropic National Colonization Society of America as a homeland for freed American slaves. Land was obtained by treaty with indigenous tribes in 1822, and was subsequently settled. In 1847, Liberia proclaimed itself an independent republic, but failed to live up to the name. Later generations of American Liberians established a slave-state of their own, enslaving the indigenous Liberians.

Slavery continued until the 1936, when it was abolished in the wake of scandal and League of Nations investigation. The scandal did not manage to unseat the True Whig party from its then more than half-century of domination of Liberian politics.

Liberia continued as a republic under the Whigs until April of 1980, when M.Sgt. Samuel K. Doe and his People's Redemption Council staged a bloody coup. The PRC established itself as an interim regime until 1985, when elections were held. Doe and the PRC were returned to power among allegations of election fraud.

The 1990 Civil War:

In late December of 1989, a group of rebels entered Liberia's Nimba county from the Cote d'Ivoire. They were led by Charles Taylor, a former member of Doe's cabinet who was removed from office on charges of embezzlement. Doe's response was a harsh crackdown on his own people in an attempt to stop Taylor's group, which called itself the National Patriotic Front. But Doe's crackdown served only to drive many Nimba county residents into the NPF ranks.

By February, the war had settled into a predictable pattern of low-intensity skirmishes and atrocities. The NPF held Nimba county and was slowly taking other parts of Liberia away from Doe's forces. In the meantime, Doe's military was deserting and taking their weapons. Many ended up in NPF ranks. Doe, in a frantic attempt to enlarge his military, press-ganged thieves from the Waterside district, only to have them desert and use their new-found weapons to enhance their old profession.

The atrocities came quickly now and followed tribal lines. Four of Liberia's sixteen tribes were prominent in the civil war. The Krahn and Mandingo tribes supported Doe, while the Gio and Mano tribes backed the NPF. The tribal animosities among these groups verged on genocidal. In one incident, Doe's death squads slaughtered more than 600 Gio and Mano civilians inside the St. Peter's Lutheran Church of Monrovia; the civilians were seeking asylum from Doe's troops. NPF forces were also accused in one case of breaking into a mosque and killing Mandingo members.

The rebels encircled Monrovia in June. On June 4, an NPF squad was ambushed and Taylor's strategist, the American mercenary Elmer Johnson was killed. Shortly afterwards, Prince Yormie Johnson left the NPF with a group of followers to form the Independent National Patriotic Front of Liberia (INPFL). These two events crippled the NPF and rendered it mostly ineffective for the rest of the conflict. The NPF spent the rest of the war looting and executing civilians.

In August, the flow of refugees into neighboring states caused the Economic Community of West African States (ECOWAS) to send in the 3000-member ECOWAS Monitoring Group (ECOMOG). However, ECOMOG was unable to stop the fighting and the INPFL continued to advance on Monrovia, eventually being able to exercise control over portions of it. Doe spent the last months hiding in his presidential mansion in the company of his "Satue" presidential guard battalion. Whether he was there by choice or under house arrest by his Satue was never clear, as Doe's guards said that he would not leave Liberia without them.

Doe left the presidential mansion on September 9th and travelled to the ECOMOG headquarters but was intercepted by Prince Johnson. Doe's accompanying bodyguards were killed, and Doe was mutilated and tortured before being killed.

On Doe's death, there were no less than four people claiming control of Liberia. ECOMOG tolerated these for awhile, but later supported Professor Amos Sawyer as head of an interim government based in Ghana. In February 1991, ECOMOG forced the rival factions to sign a peace treaty and begin disarming, but Charles Taylor claimed he would continue to protest Sawyer's government. Taylor's NPF was recently reported to be engaging in banditry and raiding in neighboring Sierra Leone and Cote d'Ivoire. Both Johnson's INPFL and General Hezekiah Bowen's Armed Forces of Liberia (AFL) have chosen to support Sawyer.

The war created an estimated 700,000 refugees and an unknown number of civilian casualties. International trade channels had been eliminated by the fighting, cutting off food shipments and causing deaths from starvation among more civilians. Power-sharing negotiations following the peace treaty remain bogged down, mostly due to Taylor's resistance to any such agreement. Liberia's immediate future remains grim.

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Forces in Liberia's War

The four groups with forces in Liberia during the civil war were the **Armed Forces of Liberia** (AFL), the **National Patriotic Front** (NPF), **Independent National Patriotic Front of Liberia** (INPFL), and the **Economic Community of West African States Monitoring Group** (ECOMOG). Little data is available on the organization of these forces other that the AFL. What does exist has been collected from photographs and first-person accounts by journalists.

The AFL were and remain a small army, which has decreased in personnel and equipment due to desertion and thievery. The AFL are presently headed by General Bowen and before the civil war consisted of 6300 troops in 10 battalions. There were 6 infantry battalions, 1 artillery battalion, 1 armored recon battalion, 1 executive mansion guard (Satue) battalion, and 2 support battalions. An aerial reconnaissance squadron with 20 propeller-driven aircraft also existed.

Infantry units are believed to follow American squad organization and field an array of old weapons including M2HB HMGs, M1918M2 BAR automatic rifles, M1919A4 LMGs, and M-16A1 rifles sometimes with M-203 grenade launchers. Doe also purchased AK-47s from Romania before he was overthrown and his military was also fielding these. Photographs during the civil war showed weapons to be in poor condition. Support equipment included 3.75" Super Bazookas, M40A2 106mm recoilless launchers, 60 and 81mm mortars, 3 M116 75mm howitzers, and 8 M101 105mm howitzers. Armored vehicles included WW II-era M3 halftracks and recently purchased MOWAG 4x4 Piranha vehicles fitting twin machineguns. Most mechanized transport was accomplished by civilian trucks. The AFL was, and likely is, composed of ill-trained and poorly motivated troops. However, the AFL were the only troops with any real organization during the war.

The guerrilla groups started under Charles Taylor's NPF banner in 1989. They are reported to have received training and aid in Libya, but probably followed American-style squad organization in the early part of the war due to Elmer Johnson's leadership. During the later part of the war, the NPF and INPFL did not appear to have any organization or discipline. Weapons maintenance appeared nonexistent, and rebels were observed going to war in bright-colored athletic gear.

Both the NPF and INPFL fielded AK-47s (mostly from AFL deserters), G-3s, Uzi SMGs, and a large amount of PPS 43 SMGs and M-1 Garand rifles. As AFL deserters joined the rebels, their arms quality improved to include M2HBs and M-16A1/M-203s.

ECOMOG forces came from a variety of nations in ECOWAS, but primarily Nigeria and

Scenario: Christmas Presents

On the Saturday after Christmas Eve, 1989, Charles Taylor and a group of rebels crossed the Liberian border into Nimba County. Their arrival was noticed by Doe's army, which moved swiftly to attempt to throw the intruders back into Cote d' Ivoire. However, the NPF intruders had substantial support in Nimba County already because of tribal affiliations. Also, the initial group of NPF had likely received military training from Libya, and was composed of motivated and capable fighters. Thus, the NPF were able to continue to advance into Nimba county.

At this time, Doe denounced the NPF attack as an attempted coup by foreign mercenaries and stated that the coup had been put down. He followed this with a harsh security crackdown on the Liberian people, but the crackdown served only to drive more people to the NPF ranks. Fighting continued despite Doe's pronouncements.

This scenario simulates an AFL counterattack on a NPF rally point in a Nimba County village. The AFL must capture or kill all NPF members in the village, while the NPF must repel the attack. Numerous civilians sympathetic to the NPF are in the village and serve as obstacles to the combat.

NPF: The NPF troops have crossed the border a few days ago and, after an attack on an AFL border post, have fallen back to this sympathetic village to rally for another attack. They realize that the AFL is hunting them, but have had little time to prepare a defence. This squad has been assigned a rearguard action so that the remainder of the NPF troops can move to safety. They must hold as long as possible, then exit the map. NPF units set up in the village in the open.

NPF Units:

Number	Quality	Weapons
1	Line	AK-47
6	Militia	PPS 43
1	Green	RPK
1	Green	AK-47 & RPG 7V with 5 HEAT

Injuries: 3 of the NPF Militia troops have been wounded and suffer a 1 point penalty to their Combat Actions.

Ammunition: Except where otherwise noted, all troops carry 6 magazines of FMJ. The RPK gunner only has two drums of FMJ. All units also carry 3 RGD-5 hand grenades

each. Players may substitute Uzis for the PPS 43s.

AFL: The AFL has two nine-member squads in pursuit of the NPF rebels. They must break through any rearguard and secure the village.

AFL Units:

First Squad

1	Line	M-16A1
2	Green	M-16A1
1	Militia	M-16A1/M-203 w/ 10 HE
4	Militia	M-16A1
1	Militia	BAR A2

Second Squad

3	Green	M-16A1
1	Militia	M-16A1/M-203 with 10 HE
4	Militia	M-16A1
1	Militia	BAR

Ammunition: Unless otherwise stated, all troops carry six magazines of FMJ. They also each carry 2 M26A2 hand grenades. Players may substitute M-60s with one belt in place of the BARs.

Civilians: There are 20 civilian noncombatants in the village, and these serve primarily as obstacles in combat. Both NPF and AFL troops should try to avoid killing the civilians, but are not required to protect them. Normally, a political loss would occur if civilians were killed, but given the nature of the war, each side will blame the other, and the deaths will become blurred by a hail of counteraccusations. Civilians treat the AFL as a hated authority.

Victory: Victory is achieved by the NPF if they can hold the village for 15 minutes before moving off the map. The AFL wins by preventing the NPF victory.

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Scenario: Death of Elmer Johnson

Elmer Johnson was the primary military advisor to Charles Taylor, and was responsible for the early NPF victories and maintaining the NPF as a viable fighting force through his charismatic leadership and military skill. Following his death, the NPF fell into disarray and spent the rest of the war committing brigandage.

Johnson was an expatriate Liberian who held dual American and Liberian citizenship. He had served in the U.S. Army in the early 1980s, and had returned briefly to Liberia in 1984 to take part in an abortive coup against Doe. He was captured and later released, and stayed in the United States until 1989, when he traveled to Cote d'Ivoire to advise the NPF and lead them through quick many victories over Doe's AFL.

On June 4, 1990, Johnson was leading a convoy of 30 NPF rebels in captured AFL vehicles when he was ambushed, ostensibly by 500 counterattacking government troops. He was captured and executed by the ambushers. Doe was quick to claim responsibility for the ambush and it is likely that the AFL did perform the ambush and execution, but there is also circumstantial evidence which suggests that Charles Taylor himself may have ordered Johnson's execution.

This scenario is a scaled-down version of the ambush with the goal of the NPF being simply to survive the attack, and the ambusher's role being to wipe them out. Players wishing to play with realistic forces should simply multiply all units by 3.

NPF: The NPF is led by Charles Taylor and is ferrying troops from the captured Firestone plantation to Roberts Field when it is ambushed. At this time, NPF ranks have been swollen by new recruits, so while morale is high, troop quality is quite low. NPF objectives are to survive the ambush. NPF troops set up in vehicles on the road.

NPF Units:

1	Line	M-16A1
3	Green	M-16A1
1	Militia	RPK with 1 drum
5	Militia	PPS 43

Ammunition and Weapons: Except where otherwise stated, all troops carry 6 magazines FMJ and 3 RGD-5 hand grenades each. The PPS 43 may be replaced by the Uzi SMG.

Vehicles: The NPF troops are riding in 2 civilian pickup trucks.

Ambushers: The purpose of this ambush is to destroy the entire convoy. Positions have been carefully selected and explosive weapons are available ensure that nothing leaves the kill zone. Ambushers set up anywhere on the map, and may even move the log barricade.

Ambush Units:

1	Line	M-16A1
4	Green	M-16A1
10	Militia	AK-47
2	Militia	BAR A2
3	Militia	M16A1/M-203 with 10 HE

Ammunition and Weapons: Except where otherwise stated, all troops carry 6 magazines FMJ. Also available are 2 M26A2 hand grenades each, and a total of 4 command-detonated Claymore mines. The BARs may be replaced with M-60s with one belt each.

Victory: This is a simple scenario. To win, the ambushers must kill or capture all of the NPF troops. NPF troops must try to prevent that. Note that if Johnson (the Line trooper on the NPF) is captured or killed, it is a propaganda victory for Doe's AFL.

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Scenario: Snuff Films

Samuel Doe came to power in a bloody coup in 1980, and the years that followed saw Liberia on a path to devastation. Doe's economic policies served to destabilize the national economy and saw Liberia become heavily dependent on foreign aid. The United States provided Liberia with $50 Million annually, but much of it went to the pockets of the corrupt officials of Liberia, including Doe himself.

The civil war saw Samuel Doe becoming more and more desperate as his AFL was unable to suppress the NPF and INPFL rebels. His desperation finally drove him to attempt to escape Liberia by traveling towards the ECOMOG headquarters to request asylum. He was intercepted by Prince Johnson and a group of INPFL rebels.

Doe's 60 accompanying Satue were overpowered by INPFL troops and executed. Doe himself was stripped, mutilated, and shot as Johnson questioned him about the Liberian treasury. Doe's ears, fingers, and hair--believed to be a source of magical powers--were removed and Doe was then left to bleed to death in a nearby girl's washroom. The last hours of Doe's mutilation and life were captured for posterity on VHS videotape by an INPFL cameraman.

This scenario simulates a scaled-down meeting engagement between Doe and his Satue and Johnson's INPFL. Players command either Satue or INPFL troops.

INPFL: Johnson and his INPFL have heard that Doe is moving towards the ECOMOG headquarters, presumably to seek asylum. Johnson, the INPFL leader, sees this as an opportunity to end the war and locate the Liberian treasury, so he has led a force to intercept Doe. INPFL troops must capture Doe. They set up on the south side of the street.

INPFL Units

Johnson	Green	AK-47, Colt Python 6"
4	Green	AK-47
5	Militia	Beretta M12S
5	Militia	AK-47

Ammunition: All units carry 3 magazines FMJ. Johnson carries 24 rounds of JHP for his

python.

Satue: As part of Doe's elite bodyguard battalion, the Satue received many privileges and much of the anger of the Liberian people opposed to Doe. The Satue were also in a substantial position of power over Doe, and they promised that Doe would not leave Liberia without them during the several months when he barricaded himself in his presidential mansion, indicating that Doe was under a form of house arrest. Now, Doe has finally tried to go into exile, and has taken some of his Satue to the ECOMOG headquarters to seek asylum, but the party has been intercepted by an INPFL force. Satue troops must get Doe to the ECOMOG headquarters which means exiting off the south edge of the map. Satue troops set up on the north side of the street.

Satue Units

Doe	Green	S & W M-19 6"
2	Line	M-16A1
4	Green	M-16A1

Ammunition: All Satue troops carry 6 magazines FMJ. Doe carries 24 rounds JHP for his M-19. Doe and the two Line troops also carry 2 M26A2 hand grenades each.

Victory: If Doe is captured, it is a major victory for the INPFL. If Doe is killed, however, the encounter is a draw, because Johnson does not get to question Doe and there is the potential for making Doe a martyr. If Doe manages to exit off the south edge of the map, it is a victory for the Satue.

Variant 1: This scenario had forces scaled down by a factor of 10. Teams of players may wish to try using the actual forces involved and a larger map area. If this is the case, multiply the number of units involved by 10 and provide Doe and his troops with 5 pickup trucks as transport.

Variant 2: There were stories that Doe actually made it to ECOMOG headquarters and they turned him away. Players may wish to extend the scenario or variant 1 by rolling a d10 should Doe make it past the INPFL forces. On a 0-2, ECOMOG grants asylum, and Doe wins. However, on a 3-9, Doe finds the ECOMOG doors closed to him and to win in this case, Doe must then travel back to his presidential palace past the INPFL forces again.

Scenario: Terminator 5 Strikes

In March 1991, as the war began to degenerate into series of atrocities, the American embassy in Monrovia requested that all American nationals and peace corp workers leave Nimba county. Foreigners came under attack, and some were even kidnapped and killed. Even the embassy came under attack as its Liberian personnel disappeared in fear for their lives and the embassy's own Liberian guards made death threats against embassy staff.

The guards were angered that the embassy was removing taxes from their paychecks. Earlier in the year, Doe had cancelled all taxes, but the legislature had not approved the plan. The guards vented their frustration on the embassy, and may even have burned down an embassy warehouse. The day after the fire, the guards even marched on the embassy until they were stopped by the ambassador and the Liberian National Police.

One of the guards called himself "Terminator-5" and gave graphic descriptions of the harms he would cause to embassy staff during the employment dispute. On the night of the fire, he was heard to shout "It has begun," though nothing happened that night other than the fire.

The guards only embarked on a campaign of verbal terror and intimidation against the staff and did not actually commit violence against the staff. This scenario simulates what would have happened had the guards actually turned on the embassy staff and attempted to loot the embassy. This action is a night action with a half moon and no artificial lighting in the embassy grounds.

All buildings except the main embassy building are single story. The embassy building is a two-story building.

Guards: The embassy guard units have been angered by the deduction of taxes from their paychecks. In the troubled civil war economy, American dollars keep them and their families from starving. However, to protest against the Liberian government would be suicidal as the Satue or AFL would quickly kill them. It is much safer to protest against the embassy. Tonight, however, a group of guards intends to do more than protest. A squad has gathered and will attack the embassy building and attempt to loot it for cash and valuables. Prisoners are required to show the locations of valuables, or as hostages to force the cooperation of the other staff. Guards set up in the embassy grounds.

Guard Units:

2	Green	M1 Carbine

10	Militia	M1 Carbine
5	Militia	M-870 with 20 rounds "00"

Ammunition: All guards carry 3 magazines FMJ. They also carry up to 10 petrol bombs (molotov cocktails).

Staff: The staff at the embassy has been cut back as much as possible, and only essential people remain. They are staying in the embassy residences because local residences have become too dangerous. The majority of the staff are civilians, but there is a trio of USMC guards to provide some measure of protection. The staff must hold off the attack of the guards and prevent the guards from injuring the staff. Spare weapons exist for some of the staffers who wish to join in the defence. Staff set up in the main embassy building.

Staff Units:

2	Line	M-16A2
1	Line	M-870 with 30 "00" & 10 slugs
4	Untrained	M-16A2

Ammunition: Except where otherwise noted, all units carry 6 magazines FMJ. The USMC guards (Line troops) also have access to 4 M26A2 hand grenades each and 2 tear gas grenades each. Gas masks are available for the USMC guards only.

Civilians: There are 7 unarmed civilians in the embassy building. They will see the Liberian guards as an abusive non-authority.

Spoils: There is a safe holding embassy funds and documents on the second floor of the main embassy building. It is located in the northwest corner of the floor.

Victory: The Liberian guards score a major victory if they can loot the safe of the embassy. The embassy staff win by preventing this.

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Scenario: Streetfighting

A common encounter in the Liberian war was streetfighting between NPF or INPFL forces and Doe's AFL troops. There were dozens of small villages which were taken in streetfighting. The streetfighting in these wars had a special flavor quite unlike the streetfighting in other wars. Prepared defences were not present, and troops did not often resort to using buildings as cover, preferring instead to use items in the street itself. Sometimes, quick passage through a building was all that was required to perform a flanking maneuver.

This scenario allows players to try streetfighting in a small Liberian village with infantry and with variants allowing for vehicles and mortar support.

Rebels: These are either NPF or INPFL troops who have been given orders to take the area around the town square, presently a no-man's land. In the basic scenario, only an infantry element is available. The rebel squad sets up north of the church.

Rebel Units:

2	Line	AK-47
4	Green	M1 Carbine
1	Green	RPK with 2 Drums FMJ
	1 Green	PPS 43, RPG-7V with 10 HEAT Rockets
	4 Militia	M1 Carbine

Ammunition: Except where otherwise noted, all units carry 6 magazines FMJ. Units also carry 2 RGD-5 hand grenades ach. The PPS 43 may be replaced by an Uzi SMG.

AFL: The AFL troops have encountered rebel units operating in the village, and have been ordered to take the town square. Only an infantry element is available. AFL units set up south of the school.

AFL Units:

2	Line	AK-47
1	Line	M-16A1/M-203
4	Green	AK-47
1	Green	BAR A2
2	Militia	AK-47

Ammunition: All units carry 6 magazines FMJ. The BAR A2 can be replaced by an M-60 with one belt FMJ.

Variant 1: To increase the confusion of the streetfight, add the following forces to each side. This variant is quite suitable for team play.

Rebels add:

1 more squad as above

3 Pickup trucks with Green crews.

AFL add:

1 more squad as above

1 Pickup truck with a Green crew.

Variant 2: To alter the basic scenario to simulate fighting in one sector of a larger battle (such as the outskirts of Monrovia), double the size of the basic rebel forces and add a battery of 2 M-19 60mm Mortars off the map for the AFL. Provide both HE and WP mortar rounds. This battery is company level fire support for the AFL troops. The ”Artillery System” will be required for this variant.

Variant 3: The basic scenario does not deal with civilians. Most civilians would have left the area to the soldiers, but for those players wishing to add stragglers, roll a 0-9 the first time a building is entered by either side. On a 1, a single civilian is inside. On a 0, there are two civilians, and one is armed with a melee weapon (such as a machete). Resolve actions for these civilians as necessary.

Victory: Victory is determined by who controls the town square at the end of the game.

This Land is Our Land

The **Russian Roulette** and **In the Name of God** scenario packs were originally part of a much larger work called **Phoenix Command: Low Intensity Conflict**, which included scenarios from a number of wars raging in 1990-91, including Canada, El Salvador, Sri Lanka, and Liberia, in addition to the scenario packs on Russia and Israel.

In 1990, Canada came to the brink of a civil war. A small Quebec town's bid to develop a golf course on the land of a Mohawk Indian reservation led to blockades of two Mohawk reservations and an armed standoff between a group called the Mohawk Warriors and the Canadian Army. The blockade resulted in sympathy blockades and fears of violence spreading across the entire nation. This scenario pack includes a series of scenarios that highlighted different facets of the conflict, from Warriors fighting for sovereignty, to Police seeking to keep the peace, to the Canadian Armed Forces blending their traditions as soldiers and peacekeepers to keep the conflict from spinning into violence.

INTRODUCTION

The Oka Cirsis started when the small Quebec town of Oka wanted to expand their golf course and build a private housing pro-ject. The land slated for these developments was titled to the town, but the Mohawks of the Kanasetake reserve bordering Oka claimed the land was sacred to them and part of an outstanding land claim.

On March 11, 1990, the Mohawk Warrior society erected dirt and log barricades to their reserve and the disputed land. Court challenges and mediation followed until July 11, when Oka Mayor Jean Ouellette ordered the ”Surete du Quebec” (SQ) to take down the barricade. The SQ used tear gas, stun grenades, and assault rifles in a disastrous assault which ended with SQ Cpl. Marcel Lemay dead. The assault inflamed the situation and led to the Mohawks of the Kahnawake reserve barricading the Mercier bridge in sympathy for the Oka Mohawks, thus cutting off access between the South Shore and Montreal. A siege ensued with food and medicines being withheld from the reserves for awhile.

Racial tensions rose in the weeks that followed, with Royal Canadian Mounted Police and SQ contending with mobs of rioting whites in Chateauguay.

On August 17, Canadian Army troops replaced SQ and RCMP units at the barricades at the request of Quebec Premier Robert Bourassa. The standoff continued until late September, when Canadian Army personnel and Mohawk Warriors cooperated in dismantling the barricades on August 29. Although rioting incidents between Mohawk civilians and Canadian Forces did occur and the white riots continued, the removal of barricades was peaceful.

After the barricades were removed, some Mohawk Warriors who had been manning the barricades retreated to the Oka Drug and Alcohol Rehabilitation Treatment Centre (TC), where they continued the standoff behind an ever-closing circle of Canadian Forces razor wire.

Finally, on September 27, the holdout Warriors in Oka turned themselves over to Army custody. The crisis was over.

Since that time, the Mohawk Warriors which were taken into custody have come up for trial on various riot and weapons charges. There was another flare-up of tensions at Oka in January 1991 when police attempted to charge a Mohawk with speeding—the result was a riot involving 100 Mohawks and police.

In the end, the crisis was not about the disputed lands, for the Federal Government had purchased the lands and turned them over to the Kanesatake reserve on August 31. Instead, the issue was about the apathy of the Canadian governments to the plight of the Native people of Canada in both racial and economic terms.

For many natives, life has been a cycle of racism, poverty, and deplorable treatment by Canadian institutions where their land, their culture, and they themselves were subject to being wiped out. The Kanesatake natives chose to fight back. But they were also fighting for something many natives desire: sovereignty. For many natives, this means being treated as distinct nations within or in partnership with Canada as a whole. Sovereignty is seen as the way in which natives can preserve their land, culture, and themselves.

Out of the crisis came the claims that the Canadian governments had shaken off their apathy. As for whether the new attitude of the governments will produce positive effects remains to be seen.

As a final note, the crisis itself was as much a public relations contest as it was a military confrontation. The Warriors used cellular phones and fax machines along with regular press conferences in order to brief the media, while the military used professional videotapes and hindered press access to blockaded reserves. Both sides recognized that the sympathy of the Canadian people was essential for a political victory. For this reason, both sides were reluctant to actually start shooting, as the aggressor would lose public sympathy, and thus lose the war.

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Forces at Oka

There were three groups involved at the Oka crisis. These were the Mohawk Warriors, the police forces, and the Canadian Armed Forces.

The Mohawk Warrior Society is a paramilitary/enforcement arm of the longhouse faction of the Mohawks. The longhouse is a traditional leadership faction and is distinct from tribal councils, the leadership recognized by the Canadian governments. Warrior societies exist on many reserves, including the Kanasetake, Kahnawake, and Akwesasne reserves. Each society consists of a disorganized collection of highly dedicated men of varying military skills. Some are ex-military and even have Vietnam experience while others are teenagers. Their main small arms include civilian rifles and shotguns, and a very large amount of semi-automatic military-type rifles from 5.56 to 12.7mm calibres. Support equipment consisted of dynamite, boobytraps, and petrol bombs (molotov cocktails). Canadian Armed Forces videotapes suggested that the Warriors also had possession of illegal automatic weapons and military-type antitank weapons such as M72 LAWs and RPG-7s. The key defensive assets of the Warriors during the crisis were a series of dirt, log, and vehicle barricades designed to slow or stop armour and infantry assaults.

The police forces were involved during the early part of the crisis and were relieved by Canadian Armed Forces personnel on August 17. The first police force on the scene was the ”Surete du Quebec” or Quebec Provincial Police. The SQ is primarily a rural police force equivalent in function to American State Troopers. It regularly contracts with small communities to provide police services for them. As such, it is inexperienced in the sort of civil unrest as it encountered at Oka. The SQ was supported by the Royal Canadian Mounted Police, a national police force with a broader range of experience than the SQ. Both police forces manned barricades of their own outside of the reserves and contended with rioters in Chateauguay. The police forces' equipment includes AR-15s, M-16s, M-870 shotguns, and HK-MP5A2 and MP5K submachineguns, along with an assortment of sidearms and concussion and tear-gas grenades. The automatic weapons are usually issued to SWAT-type units, while regular police officers carry shotguns and possibly AR-15s.

Finally, the Canadian Armed Forces are a small but highly professional and very well-trained military force. They were brought in at the request of Premier Bourassa and nominally placed under his command. It should be noted that the Canadian Armed Forces handled themselves with a great deal of profession-alism and discipline during the crisis, and this professionalism was what kept the crisis from degenerating into a civil war.

Assigned were the 3300 person 5th Mechanized Brigade, the 430th Tactical Helicopter Squadron, and the CSV Acadian--a 50 foot navigation training vessel. A fighter aircraft

squadron was also used for photo reconnaissance.

Canadian Forces are armed with M-16A2 rifles (C7s), M-203 grenade launchers, and M-249 Minimi SAWs (C8s). They also normally carry M72A2 LAWs and can carry 84mm Carl Gustav Recoilless Launchers. Vehicles at the time of the confrontation included M113 APCs (and M150 TOW and M125
81mm Mortar carrier variants), Grizzly APCs, Cougar Fire Support Vehicles, M113 1/2 Lynx Reconnaissance vehicles, M109A2 105mm self-propelled howitzers, and 3 Leopard 1A4 MBTs fitted with bulldozer blades (no ammunition was issued for the main guns of the MBTs during the crisis).

Aircraft included the Bell UH-1N Huey and the Bell OH-58 Kiowa helicopters.

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Scenario: Violence at Akwesasne

The St. Regis-Akwesasne reserve straddles the New York, Ontario, and Quebec borders, and it was the scene of violent confrontation between Warriors and other Mohawks in May 1990. The reserve's main economic base is a series of bingo and gambling establishments on the New York side, and these businesses are protected by the Warriors and others. On the Canadian side of the reserve, a group of Mohawks wanted to diversify the reserve economy and shut down some of the gambling interests. Tensions continued to rise on the reserve between groups to the point where both were taking up arms. Shortly after the Canadian Mohawks requested police intervention, there was a nine-hour gun battle between the two groups which left two people dead. In a joint operation, police forces from Ontario, Quebec, and New York State moved onto the reserve to restore order. The incident marked a turning point in the militancy of the Warrior society and served as a precursor of the Oka crisis. Some of the Akwesasne Warriors ended up behind the barricades at Oka, as did Warriors from several other reserves in both Canada and the United States.

This scenario simulates the clash between the two groups of Mohawks. It is essentially a case where armed men went looking for trouble and found it in a rural neighbourhood.

Pro-Gambling Forces: There has been a long period of intimidation and rising tension, with people on both sides of the dispute calling for external intervention. The anti-gambling forces have put up barricades to keep the white customers off the reserve and out of the casinos. There have already been skirmishes, but no injuries yet. This night, the opponents have set themselves up in front of a house and are refusing to back down to pro-gambling Warrior pressure. Considering the steady increase of tension over the past few weeks, such defiance amounts to a direct challenge. The Warrior player's orders are to take his group of Warriors and overrun the house, using force if necessary. Warriors and two pickup trucks set up on the road. The two green troops armed with Pythons are drivers.

Pro-Gambling Units:

Number	Quality	Weapon
3	Line	AK-47 (semiauto)
1	Green	Ruger Mini-14
1	Line	M-870

2	Green	Python (6")

Ammunition: Combatants with rifles carry 10 magazines FMJ while the shotgunner carries 40 rounds "00". The two with Pythons carry 50 rounds of JSP each.

Anti-Gambling forces: From the anti-gambling forces' perspective, the Warriors' intimidation tactics have served to increase the tension to the breaking point. There have already been gun battles, and the police station has been attacked twice, once with explosives, and again a few days later with an overnight fusilade of small-arms fire. Confrontation happened before, but tonight will be when the shooting starts in earnest. Anti-gambling units must prevent the Warriors from overrunning their positions, but must avoid casualties. Anti-gambling units start anywhere in the yard of the house, but may retreat to the house later on.

Anti-gambling Units:

Number	Quality	Weapon
2	Line	AK-47 (semiauto)
1	Line	Sako 30'06
1	Militia	M-870
2	Green	Mini-14

Ammunition: Combatants with AK-47s or Mini-14s carry 10 magazines FMJ. The combatant with the SAKO carries 50 shells FMJ, while the shotgunner carries 40 shells "00"

Special Rules--Night Action: This action is a night action with limited lighting (-6 ALM). Warriors may use the pickups for illumination of the battle scene, thus dispensing with the visibility ALM for everyone over clear terrain, but giving anyone directly looking into the lights a -8 ALM.

Victory: The battle lasts as long as the ammunition holds out. No extra reloads will arrive. If the anti-gambling player remains on the starting property at the end of the skirmish, then he wins a strategic victory by standing up to the pro-gambling forces' intimidation. If the pro-gambling player has managed to kill, capture, or run off all the anti-gambling combatants, then he wins a strategic victory by showing the community the power of the pro-gambling faction.

Scenario: Women and Children

July 11, 1991 was the turning point in what had been a drawn-out but quiet protest by the Mohawks of Kanesatake against the plans of the Oka town council. On the day before, the town council had obtained a court order forcing the Mohawks to remove their simple log barricades and stopping them from preventing work on the expansion of the town golf course. Oka Mayor Jean Oulette, despite the urgings of Quebec Native Affairs Minister John Ciaccia for compromise, intended to see the court order enforced.

Before dawn, SQ squad cars and vans arrived at the barricades and the SQ assault teams deployed. After SQ requests to speak with a spokesperson were not met the SQ launched a volley of tear gas grenades over the barricades. These gas grenades were fired despite the presence of Mohawk women and children.

More negotiation followed as police reinforcements and dogs were brought in. Some women confronted the police officers, sprinkling them with ashes and sweetgrass. Warriors used chainsaws to fell trees to prepare more barricades.

Finally, shortly before 9:00 AM, the police moved in. Their plan was to use a show of overwhelming force to remove the Mohawks from the barricades. They fired tear gas and concussion grenades and advanced towards the barricades. The Warriors, seeing that their women and children were endangered, responded with gunfire.

Both sides laid down barrages of suppressive fire. Seconds after the shooting started, SQ Cpl. Marcel Lemay was wounded. An ambulance quickly came on the scene and took him to the hospital where he later died, the only casualty of the battle. The other SQ officers, unprepared for the heavy resistance of the Warriors, began to retreat, abandoning several of their vehicles in the process. These vehicles were later used to create a new barricade by the Mohawks.

What had started as a small dispute had bloomed into an armed uprising. This scenario simulates the final push of the SQ on the barricades, and the full resistance of the Warriors. Also involved are Mohawk civilians, which serve to complicate the scenario. This scenario may be played as a one-on-one game, but is quite suited to team play due to the large number of forces involved.

Warriors: The Warrior player has the twin goals in this scenario of defending the barricades, and ensuring the civilians are unharmed. This means repelling the SQ assault and directing groups of civilians off the map. Warriors set up in the rifle pits and woods.

Warrior Units:

Number	Quality	Weapons
2	Militia	Mini-14 (semiauto)
2	Green	AK-47 (semiauto)
1	Green	RPK (full auto)
1	Green	Sako 30'06 with 50 shells FMJ
5	Line	AK-47 (semiauto)
1	Line	M-870 with 30 shells "00"
4	Crack	AK-47 (semiauto)

Ammunition: All combatants, except where otherwise stated, carry 10 magazines FMJ.

Support Equipment: Warriors also have a total of 3 caches of 10 petrol bombs each.

Surete du Quebec: The SQ player must advance and take the barricade, by force if necessary. The plan calls for an overwhelming show of force in hopes of frightening the Mohawks away from the barricades, and tear gas and stun grenades are available. Political considerations force the SQ player to avoid casualties on the Mohawk side, meaning he cannot use rifle fire first, but can use riot control weapons at his disposal. Police units set up at the police start position.

SQ Units:

Number	Quality	Weapon
Assault Team		
2	Crack	M-16A2
2	Line	M-870 with 30 shells "00" each and 20 "launcher" shells each.
4	Line	M-16A2
Patrol Officers		
4	Green	M-16A2
4	Green	M-870 with 30 shells "00" each.

Canine Team

2	Green	S & W M19 (6" bbl) with 24 rounds of .38 spl JSP.
2	German Shepherd Police dogs	

Support Equipment: Assault teams wear Medium rigid body armour (flak jackets), and patrollers wear medium flexible armour (Kevlar vests). All police units wear medium rigid riot helmets and gas masks. All police troops carry 3 flash and stun grenades and 3 tear gas grenades. An ambulance and 2 Emergency Medical Technicians are available in one of the vehicles.

Ammunition: All police, unless otherwise stated, carry 6 magazines FMJ.

Special Rule--Shotgun Launchers. These are cowlings which attach to the muzzle of a 12 gauge shotgun and are designed to hold cylindrical grenades like stun or smoke/gas grenades. The grenade is inserted into the cowling and the pin is pulled. The cowling prevents the striker lever from flipping off until the grenade is launched from the cowling by firing a special blank launcher cartridge in the shotgun. The grenades can be direct fired and indirect fired to a maximum range of 60 hexes. Players should use the rules for indirect fire of rifle grenades in the ”Artillery and Indirect Fire System” Basic operation includes 4 AC for arming the grenade, 2 AC for placing it in the cowling, and 1 AC for assuming a firing stance before aiming can begin. Note that the fuse of the grenade does not start running until after firing. For direct fire, use the shotgun's Aim Time statistics to a maximum of 6 AC aim.

Police Dogs: For simplicity, the dogs will always be under the control of their masters and will follow all orders. They will not be spooked at any time by anything. Their only limitation is that they will not advance into an active tear gas cloud, or an area where tear gas was applied.

Civilians: There are 15 women and 5 children placed randomly behind the barricades. SQ are considered a hated authority.

Victory: The battle lasts until one side is neutralized or retires from the field or the ammunition runs out. Military victory is decided by who controls the barricades at that time. Political victory is much more important and is decided as follows. Both Warriors and SQ start with 100 points. For each civilian wounded or killed, the side which inflicted the shot deducts 10 points from its score per civilian. If a Warrior is wounded or killed by SQ fire, the SQ deducts 10 points per Warrior. If civilians have been targeted for any attack, the SQ deduct 20 points. If an SQ officer or animal is wounded or killed, both sides deduct 10 points per officer or animal. The side which can claim military victory can add 30 points to its score. In reality, the SQ suffered a military and political defeat with scores roughly Warriors: 120 and SQ: 70.

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Scenario: There are Women and Children Here

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Scenario: Armour on the Mercier

On the morning of August 29, 1991, the Canadian Armed Forces, with the assistance of the Mohawk Warriors at Kahnawake, began taking down the barricades on the Mercier bridge. The initial tension and preparation for an armoured assault on the bridge was broken by the offering of a peace pipe by the Warriors and some short negotiations between Warriors and Army officers on the scene. For those wishing to avoid bloodshed, this was a powerful example of how the crisis could be resolved peacefully and without the partisanship that hampered formal negotiations.

This scenario simulates the situation where the peace pipe had not been offered, and the military had travelled forwards to take the bridge by force. It is a complex scenario incorporating a large number of units and a wide variety of weaponry and vehicles and thus is quite suitable for team play.

Players take either the role of the Mohawk Warriors or the Canadian Forces. Warriors will be manning the barricades and the Army will be attempting to remove them. Either side may fire first as this is a full-scale civil war which, fortunately, never happened.

Warriors: Protection of the barricades is a secondary goal. The focus is on keeping the Warriors alive and fighting. Warrior command has suggested fading into the woods and engaging in harassing attacks to prevent the Canadian Forces from proceeding into the reserve. Warriors set up behind the barricade and in rifle pits off the highway.

Warrior Units:

Number	**Quality**	**Weapon**
First Squad		
7	Line	AK-47
3	Green	AK-47
1	Line	RPK
Second Squad		

2	Crack	AK-47
5	Line	AK-47
1	Line	M2HB (w/ 3 belts FMJ)
4	Militia	Mini-14 (semiauto)

Third Squad

5	Line	M-16A1

Fourth Squad

1	Line	Sako 30'06 with 50 shells
1	Militia	Mini-14 (semiauto)

Ammunition: All Warriors with detachable-magazine-fed firearms carry 10 magazines FMJ. Others carry ammunition listed.

Supporting Equipment: Warriors also have stored five caches each with 10 petrol bombs. Warriors also have access to a bulldozer and three pickup trucks. There are also numerous tripwire activated boobytraps in the woods, roughly equivalent to an M26A2 grenade in power. As a variant, players may wish to issue Warriors up to 10 M72A2 LAWs and 2 RPG-7s with 5 HEAT rockets each.

Small Arms: All AK-47s, RPKs, M16A1s, and M2HBs are capable of fully automatic fire. Dedicated players may issue sidearms in the .357 to .45 calibre categories with up to 20 bullets.

Barricades: Barricades consist of old passenger vehicles, kneeling-height concrete highway barriers (PF 680), and large sandbags (PF 40) piled up to chest height. Rifle pits are treated as field trenches and can hold 5 combatants.

Army: The Army has two goals in this scenario. First is to take the barricades and second is to advance onto the reserve to begin restoring order. This second goal may be accomplished by advancing off the south edge of the map. Elements of an armoured recon platoon will be available for the initial assault as well as one infantry platoon in Grizzly APCs. Players can use the M113 templates to simulate the Lynx, but reduce target size by 2 on all aspects to reflect the lower profile of the Lynx. Accurate templates are in the works for the Lynx and will be posted on the website in due course. Use the LAV-25 templates for the Grizzly, but replace the main armament with an M2HB .50 calibre machinegun, with a coaxial .30 calibre M1919A4 machinegun from the WWII WDS.

Army Units:

Recon Elements:

2 Lynx Recon Vehicles Line crews of 3 each.

Mechanized Platoon:

4 Grizzly Wheeled APCs Line crews of 3 each.

3 Rifle Sections in above APCs. See below for T.O. & E.

1 Command Group in above APC. See below for T.O. & E.

T.O. & E. Rifle Section (diminished)

Number	Quality	Weapon
1	Crack	M16A2
4	Line	M16A2
1	Line	M249

T.O. & E. Command Group

1	Crack	M16A2 and FN Mk-1 pistol with 1 magazine FMJ
2	Line	M16A2

Ammunition: All soldiers, unless otherwise stated, carry 10 magazines FMJ. M249 gunners carry 2 ammunition boxes of belted FMJ. Each section is allowed 4 M-72A2 LAWs and each soldier carries 4 M26A2 hand grenades.

Variants: The same scenario as above, except that it is a night assault. Canadian forces will have a rifle section on the ground beneath the bridge to try to soften the Warrior positions by stealth, before the armour rolls in. Smoke and tear gas grenades will be available to this rifle section. Another variant is to allow the Army players the option of negotiating, using the Diplomacy rules.

Tactical Notes: This scenario represents Warrior forces as seen by the media. That is, their main weapons are small arms and petrol bombs. Against an armoured force, the Warriors would not be expected to last very long. Indeed, Warrior plans only called for the slowing of armour so that their high-powered rifles and petrol bombs could attack them, before the Warriors themselves faded into the woods to continue a long-term guerrilla war. Their defences were arrayed in such a manner as to impede the progress of armour, and thus offset its advantage. The light-skinned vehicles of the Canadian Armed Forces are quite vulnerable to heavy-calibre weapons fire. Players wishing to upgun the Warriors to the weapons suggested by the Canadian military should feel free to do so.

However, even if the Army force is destroyed, the Canadian military possesses airstrikes, artillery, and heavier armour in the form of Leopard and Cougar AFVs. In short, there would have been no way for the Warriors to claim any more than a minor political victory in the long

term.

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Scenario: On to the Barricades

There was a sense of hope in the nation following the removal of the Kahnawake barricades. The day after the Kahnawake Warriors and Armed Forces Engineers started removing the barricades on the Mercier bridge, Federal Minister of Indian Affairs Tom Siddon announced that the Federal Government had purchased the disputed lands from the town of Oka and planned to turn the lands over to the Mohawks. Many Warriors at Kanesatake chose to slip away and leave the defence of the barricades to others.

However, the hopeful situation was marred by the Quebec government breaking off negotiations, and by the beating of Kanesatake Chief Francis Jacobs and his son by a group of Warriors. The Chief had been critical of the Warrior's tactics of ransacking the vacant houses of Mohawks who chose to leave the reserve during the crisis. The beating was taken by the Canadian Armed Forces as a sign that all order on the reserve was lost and they moved in at 1:00 PM on September 1. Infantry and APC units crossed the now-undefended barricades and proceeded onto the reserve, where they were met by Warriors who screamed at the soldiers to fire the first shot. A confrontation began to flare until Jennie Jack, a Warrior messenger, ordered the Warriors to retreat to the Treatment Centre compound. The rest of the reserve was occupied, and the siege of the Treatment Centre began.

This scenario simulates the meeting of the Military and Warrior forces behind the barricades. Both sides are quite hesitant to open fire, but will do so if necessary. Both sides have their orders and intend to carry them out.

Because this scenario focuses on avoiding combat, it provides a good platform for learning initiative and morale rules. Playing with these rules is strongly recommended.

Warriors: The Warriors must prevent Army units from moving onto the reserve until otherwise ordered by a messenger. Standing in front of advancing troops is permitted, but firearms combat is not. Warriors are under orders not to fire the first shot, and to do so would result in a political defeat. As Warrior commander, the player commands tense troops of varying skill levels ranging from militia to line. They must be carefully controlled, because they may break under the tension and open fire. Warriors set up in the rifle pits or woods surrounding the barricades.

Warrior Units

Number	Quality	Weapon

3	Militia	AK-47 (semiauto)
4	Trained	FN-FAL (semiauto)
5	Line	AK-47 (semiauto)
1	Line	RPK
1	Crack	M-870 with 50 shells "00" and 20 slugs.

Ammunition: All Warriors, unless otherwise stated, carry 20 magazines FMJ. The RPK gunner carries 2 drums. Sidearms and petrol bombs are also available, along with numerous boobytraps in the woods.

Warrior Messenger: The Warrior command will send an unarmed messenger on a 4-wheel ATC to the barricades some 5 + (5) minutes after the military crosses its razor wire. Roll a 0-9 once she contacts the Warrior commander on the map. On a 0-5, she orders the Warriors to fall back. On a 6, she orders them to hold their ground but only fire if fired upon, and on a 7-9, she orders them to be the first to shoot.

Army: For the Army, removal of the barricade without bloodshed is essential for a victory in this scenario, but either way, the barricade must come down and forces advance onto the reserve. If any gunfight breaks out, a political loss occurs, and this is made even worse if the Army fires the first shot. The army sets up behind its razor wire barricades.

Army Units:

Number	**Quality**	**Weapons**
Command Group (Negotiating group)		
1	Crack	M-16A2 and FN-Mk1
2	Line	M-16A2
Rifle Section (diminished)		
3	Line	M-16A2
2	Green	M-16A2
1	Line	M-249

Vehicles:

1 Lynx Armoured Recon Vehicle, Line Crew of 3

1 Grizzly Wheeled APC, Line Crew of 3

Ammunition: All soldiers, unless otherwise stated, carry 15 magazines FMJ. The M-249 gunner carries 2 boxes of belted FMJ. Other equipment includes 4 M26A2 Hand grenades per soldier and 4 M72A2 LAWs for the rifle section.

Special Rules--Breaking: Warrior and Army Units in this scenario are organized according to elements. An element is the most skilled trooper in an area and all friendly troops with a direct
line of sight to him. Every ten phases, sum the roll of three six-sided dice for each element and compare it to Base Odds of 8 plus the element's highest individual gun-combat skill level.

If the total is less than the Base Odds, then the element does not break. If the total is greater than the Base Odds, then the element has broken and may start shooting. Roll again for each soldier in that element to determine if he breaks at Base Odds of 6 plus each soldier's skill level. Continue rolling until either one soldier breaks or all the soldiers in the element have rolled. A broken soldier will have been panicked by some imagined threat and must immediately hipshoot at the nearest target (real or imagined)

Once a shot has rung out, each element on both sides must check again on the following impulse, but now with Base Odds 2 plus the element's highest individual skill level, to see if any more soldiers open fire. If there have been any casualties to friendly troops, Base Odds are -2 plus the element's skill level. Each broken soldier may accept commands normally, provided he can hear them. (Use Sound Detection Rules.) A cease-fire command forces the soldier to check for breaking again, but at Base Odds of 8 plus the firing soldier's skill level.

Victory: There is both a political and a military victory, with the political victory being more important. In order to win politically, a side must avoid being the first to fire and hit an opponent's unit. Military victory is determined by who controls the area behind the barricades at the end of the scenario.

Variant 1: In this variant, it is assumed that the Warriors at Kanesatake did not abandon their barricades, but remained on them, awaiting a confrontation like the one on the Mercier Bridge. As in reality, both players will be trying to avoid combat. Players take either the role of the Mohawk Warriors or the Canadian Forces. Warriors will be manning the barricades and the Army will be attempting to remove them from the barricades through negotiation or force. As an added problem, the tension level at this time is quite high, and troops on either side may open fire, thus starting a civil war. Warriors set up as above and have the same orders, but, for political reasons, must negotiate with the Army if the Army requests it. The Army also sets up as above, but has orders to remove the Warriors from the barricades peacefully, through negotiation if possible. In this variant, breaking rules apply, as do diplomacy rules below. No messenger will arrive.

Special Rules--Diplomacy: The Army Captain in negotiating has a Base odds of 4 plus his Diplomacy skill level of 3. If he succeeds on a Base Odds roll three times, regardless of the number of failures, he has convinced the Warriors to peacefully leave the barricade. It takes 30 phases per attempt. All negotiations must be face-to-face.

Variant 2: Warriors were alleged to have antitank weapons such as M72A2 LAWs and RPG-7s. Also, they were supposed to have skilled snipers with civilian hunting rifles, while other Mohawks were armed with civilian shotguns. Players may wish to "upgun" Warriors in some scenarios. Players may also wish to make smoke and tear gas grenades available to the

Army.

Notes: Obviously, the prevention of combat is essential for a "victory with honor" for both sides, so both sides should organize their units into elements with at least one very highly skilled soldier to watch over the inexperienced troops. If the shooting should start, the commanders should get control over their troops before everyone starts shooting.

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Scenario: Onen'to:kon

Shortly after the Canadian military took the barricades at Oka, some thirty warriors and dependents who refused to surrender retreated to the Onen'to:kon Drug and Alcohol Treatment Centre. The military followed close behind and soon had encircled Onen'to:kon with razor wire. The standoff would last for more than a month until the military announced it would be pulling out of Oka and turning the responsibility for keeping order over to the SQ. Warriors were incensed at the military as they feared that the SQ would retaliate for its initial defeat where Cpl. Lemay was killed.

The Warriors began negotiating to end the blockade, and on September 27, they exited the treatment centre compound ”en masse” and turned themselves over to military custody.

A few Warriors ran past the military lines, only to discover that the SQ had set up its own lines behind the military ones. Those Warriors were forcibly apprehended.

This scenario simulates what would have happened if the Canadian military had launched a final assault on the treatment centre. Warriors must repel the attackers and keep their civilian dependents safe, while Canadian troops must capture all the Warriors without harming the dependents. Because of the numbers involved, this scenarios is recommended for team play.

Warriors: At the place called Onen'to:kon, or "place beneath the pines," the Warrior Society of Oka has chosen to make its last stand. It is probably a battle which cannot be won, but which must be fought. Warriors must repel the assault of the military forces for at least an hour, after which point, a small political victory may be won.

Warrior Units:

Number	Quality	Weapon
1	Crack	M-16A1
5	Line	AK-47 (full auto)
3	Line	RPK (full auto)
5	Line	Mini-14 (semiauto)

1	Line	M-870 with 30 shells "00"
6	Green	AK-47 (semiauto)
5	Green	Mini-14 (semiauto)

Ammunition: Unless otherwise stated, all Warriors carry 10 spare magazines of FMJ. The RPK gunners each have only one drum of FMJ.

Sidearms: At the Warrior players' option, revolvers up to.357 calibre or pistols up to .45 calibre may be carried by any or all Warriors. Only two magazines of FMJ are available for each weapon.

Army: The military has received its orders. The politicians feel that the situation has dragged on long enough, and have ordered military units across the wires into Onen'to:kon with instructions to end the resistance.

Army Units:

Number	**Quality**	**Weapons**
1 Command Group		
1	Crack	M-16A2
2	Line	M-16A2
3 Rifle Sections, each with:		
1	Crack	M-16A2
2	Line	M-16A2
1	Line	M-16A2/M-203 with 8 40mm HE gdes.
1	Line	M-249 with 3 boxes FMJ
2	Green	M-16A2

Ammunition: Unless otherwise stated, each soldier carries 6 magazines FMJ.

Civilians: There are a number of civilians distributed throughout the building in the compound. These range from journalists to infants. They must be kept safe, or the Army suffers a major political defeat, and the Warriors suffer a personal defeat.

Civilian Units:

Number	**Quality**	**Notes**

10	Untrained	Women
15		Children
10		Journalists

The women may be armed by the Warriors and used as untrained troops. Neither the children nor the journalists will fight.

Victory: For Warriors to win a victory in this scenario, they must hold off the Army platoon for one hour. This will show the nation that they remain prepared to fight and can do it effectively. The Army must take the treatment centre and capture all the Warriors without any injury to civilians in the building.

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Scenario: Lock and Load

Shortly after the last Warriors at Oka were taken into military custody, a crowd of 400 Mohawks from the Kahnawake reserve near Chateauguay gathered to protest the rough treatment of the Oka Warriors by military and police forces. In a feeble attempt to hold them back were six Canadian soldiers who used tear gas. The tear gas failed to disperse the crowd because some rioters were wearing gas masks. The crowd gathered again, this time facing down 24 more soldiers who had arrived as reinforcements. An officer ordered the soldiers to aim rifles at the crowd, specifically aiming at people who appeared to be agitators. The tactic worked, and the crowd dispersed.

This scenario is a scaled-down simulation of that riot. It is designed for two players, with one player handling the military and the other handling the agitators among the crowd.

Army: Your role is to disperse the crowd. Army units set up on the northern part of the highway.

Army Units:

Number	Quality	Weapons
4	Line	M-16A2
4	Green	M-16A2
1	M-113A3 APC	with a Line Crew. Fitted with M2HB.

Special Equipment: At the Army's disposal are 2 shotgun launchers and 20 Tear Gas grenades and launcher cartridges

Ammunition: All troops carry 6 magazines FMJ for their rifles. The M2HB on the M113 has only 1 belt of FMJ.

Agitators: Your role is to incite the crowd to attack the military. Such an attack would not only terrorize the military, but would also show to the Canadian governments that the situation is beyond their control. Agitators set up in the body of the crowd itself.

Agitator units:

Number	Quality	Weapon
4	Line	Blunt melee weapons.
4	Green	Blunt melee weapons.

Special Equipment: Gas masks. They are the only members of the crowd to wear these.

Weapons Option: At the Agitator player's option, the agitators may be armed with handguns.

Crowd: There are 80 members in the crowd. They are deployed in a skirmish line some 40 hexes away from the line of military troops. The Threat Level begins at II.

Victory: A simple victory is measured by which side manages to neutralize the other first. If the Army manages to disperse the crowd without resorting to gunfire, they win a strategic and political victory. If gunfire is used by the Army, then the Army suffers a political loss.

On the other hand, if the crowd, either with or without agitator control, manages to charge the Army line and render the line ineffective, then the agitators win a strategic and political victory.

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Page last modified: August 29, 2001

The **Russian Roulette** and **In the Name of God** scenario packs were originally part of a much larger work called **Phoenix Command: Low Intensity Conflict**, which included scenarios from a number of wars raging in 1990-91, including Canada, El Salvador, Sri Lanka, and Liberia, in addition to the scenario packs on Russia and Israel.

INTRODUCTION

Among the many wars raging at the start of the 1990s, the war in Sri Lanka was almost unknown to the world, apart from scattered news reports that would appear on slow news days.

The Republic of Sri Lanka had been fighting a brutal civil war with a group calling itself the Liberation Tigers of Tamil Eelam (LTTE) since 1983. It is a war which has seen numerous atrocities and civilian massacres. Even the intervention of a peacekeeping force from India has been unable to stop the violence. It will be a long time before peace returns to Sri Lanka.

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Background to the Sri Lankan Civil War

Sri Lanka's warring factions are divided along ethnic lines. The majority of the Sri Lankan population is Sinhalese and have resided on the island nation for millennia. The Tamils are the largest minority group and are separated into the northern Tamils, who are descendants of Tamil invaders from India from many centuries past, and the plantation Tamils, who were brought to the island to work British tea plantations in the nineteenth century.

The roots of the current war can be found in the British colonial practices. The British gained the island of Sri Lanka in 1798 as a Crown colony after a short struggle with the previous Dutch rulers. Tea and rubber estates were developed and Tamils were imported from India to work the plantations. The Sinhalese residents refused to work for the slave wages offered by the British. However, as the colonial occupation continued, the Sinhalese who had refused to work for the British found themselves passed over for education and employment opportunities which went to the Tamils. The result of British rule was the domination of the island's economic and political life by the Tamil minority.

In 1948, Sri Lanka was granted independence and a Sinhalese government was appointed. This government quickly passed legislation discriminatory against Tamils, allowing the Sinhalese greater access to land, education, and employment. Some plantation Tamils were even deported to India. The legalized discrimination continued through the 1970s, when two major Tamil parties joined to form the Tamil United Front, which would later become the Tamil United Liberation Front (TULF) and would press for creation of a separate state "Tamil Eelam", from within the system. Other Tamils, more militant than the TULF, chose the path of terrorism and became the LTTE and other guerrilla groups. These Tamils concentrated their efforts on murdering Sinhalese officials and civilians until 1983.

The War:

In July 1983, the LTTE killed thirteen soldiers with a land mine. This explosion sparked three days of anti-Tamil rioting across Sri Lanka by the Sinhalese. Rioters rampaged through Tamil neighbourhoods, burning them to the ground and killing any Tamils they found. By the time the government took action to calm the rioting, some 400 Tamils had been massacred. The government was accused of not acting fast enough to stop the rioting, and this accusation, coupled with a tradition of official discrimination against Tamils, turned many to assisting the Tamil guerrillas.

Armed with popular support among their people, the guerrillas stepped up their guerrilla and terrorist activities. In one such attack in May 1985, Tamil guerrillas dressed as government soldiers entered Anuradhapura and went on a killing spree. They attacked the Bodhi Tree shrine, a sacred site to Buddhist Sinhalese, and then rampaged through the town. At least

150 civilians died in the hour-long attack.

Civilian massacres and atrocities continued unabated until July 1987, when a negotiated peace settlement was worked out under Indian mediation. The agreement called for an Indian peacekeeping force (IPKF) to disarm the guerrillas in exchange for a full amnesty for the guerrillas and limited autonomy for Tamils. Unfortunately, the Tamils refused to be disarmed, and fighting broke out again, this time involving the IPKF. After months of fighting, the IPKF were able to remove control of the city of Jaffna from LTTE hands.

Terrorist attacks continued during the resurgence in fighting following the arrival of the peacekeeping force, and in 1987, an old terror group was resurrected. This old group was the Janatha Vinukthi Peramuna (JVP) and was composed of Sinhalese extremists who felt that the government had made too many concessions to the Tamils. The JVP, in a previous incarnation, had tried to take over the government in the short 1971 revo-lution. In its present incarnation, the JVP has launched terror-ist attacks against Tamils and government personnel, including a bombing attack on the presidential palace that almost killed then-President Jaywardene. A counter-insurgency campaign in late 1989 was thought to have effectively wiped out the JVP.

The IPKF bore the brunt of the fighting against the Tigers until 1989, when souring relations between the Sri Lankan and Indian governments and continued heavy fighting caused the recall of the 50,000 member force. The last Indian troops left on March 24, 1990.

This war, like many others, has fallen into a pattern of repeated ceasefires and combat. A thirteen-month cease fire was broken in June 1990 when a Tamil complained to the LTTE of police brutality. During 1990, several battles took place between LTTE and Government forces and Government forces discovered that the LTTE had used the ceasefire to build strong fortifications on the Elephant Pass which linked Jaffna to the rest of Sri Lanka. Combat continued until January 1991, when a week-long ceasefire occurred.

1991 saw continued military and guerrilla activity with LTTE forces attacking military bases. Terrorist activities also continued, with the assassination of Defence Minister Wijerante in a bomb blast on March 2. The war goes on.

Prospects for Sri Lanka are dismal. The hatred of the Sinhalese and Tamils for each other is simply too strong and too many civilians have been slaughtered to allow the mutual hate and fear which has existed since colonial times to be wiped out in a short time. Until one side either gives up the struggle, or gains enough strength to wipe out the other, the war will continue. At this point, the differences between the LTTE and the Government are irreconcilable.

Forces

The war in Sri Lanka is primarily fought between the Army and the LTTE, with some other groups joining the battle until being wiped out by either of the first two groups.

The Army in Sri Lanka is a large conventional force with a strong infantry base. Some 40,000 people serve in the Army, although this may have increased through repeated calls for enlistment by the regime. They are organized into 5 infantry brigades, 2 reconnaissance regiments, and 5 support regiments. Infantry weapons are mainly the AK-47 assault rifle, Bren L4 machinegun, and the M2HB heavy machinegun although other weapons can be found in service. Artillery support is provided by several small-calibre howitzers including the

25 Pounder, the 85mm Type-56, and the 76mm M-48 and this is supplemented by a small number of 106mm M-40 and 82mm M-60 recoilless launchers. Mortars include the Soviet 82mm M-37, 107mm M-38, and the 120mm M-43. Finally, Armoured units have a number of wheeled AFVs, including Saladins, Ferrets, Dingos, BTR-152s, and armoured SAMIL 100s.

Small local militia or Home Guard units provide support for the military and attempt to keep local peace along with police forces. Both the militia and police use civilian small arms, but the police may have access to military-style weapons. There also exist paramilitary Special Task Force Units, which seem to be internal security forces.

On the opposing side are the LTTE. Little is known of their structure or armaments, but they may follow a Soviet-style organization as all Sri Lankan guerrilla groups have received training either from the Palestinians in Lebanon or the Indian government. The LTTE is also believed to have received weapons from the Indian government and possibly other Marxist nations. So, speculation on likely arms for the LTTE would produce a list encompassing AK-47s and older model Soviet support weapons such as RP-46 and RPD machineguns. Photographs have also shown them fielding L7A2 GPMGs. Weapons such as DShKs and RPG-7Vs are also likely to be found, but would be rare. Rounding out the LTTE armouries would be large quantities of civilian and military rifles, pistols, and shotguns.

Other Tamil guerrilla groups would mimic the LTTE in weapons, but not numbers. The LTTE is large enough to have held off both the Sri Lankan Army and the Indian Peace Keeping Force (IPKF) while at the same time fighting the other Tamil groups to eliminate rivals. On several occasions, the LTTE has almost wiped out its rivals. These other Tamil groups include the LTTE-allied Eelam Revolutionary Organization (EROS), a terrorist group and the Three Star Group, which is a rival to the LTTE. The Three Star Group consists of the Eelam People's Revolutionary Liber-ation Front (EPRLF), the People's Liberation Organization of Tamil Eelam (PLOT), and the Tamil Eelam Liberation Organization (TELO).

The final guerrilla group is the Sinhalese Janatha Vinukthi Peramuna (JVP), or People's Liberation Front. These are Marxist insurgents who are fighting against the government which they see as having given too many concessions to the Tamils. Their weapons likely mirror the LTTE.

Of these last groups, only the LTTE currently remains a viable guerrilla organization. The others have been either wiped out by counterinsurgency efforts of the government or by LTTE attacks. Those fragments which remain have chosen terrorist tactics to continue their struggle.

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Trench Warfare

During the thirteen-month ceasefire which lasted until June 1990, both sides sought to consolidate their positions. For the LTTE in the northern provinces, this meant training, re-arming, and constructing fortifications and strongpoints. In some places, the strongpoints were little more than rifle pits and trench networks, but in other places, the LTTE had managed to build reinforced-concrete bunkers with elaborate tunnel systems.

When fighting broke out again, the Sri Lankan military found itself facing these dug-in guerrillas. In this scenario, two Sri Lankan squads and a machinegun section are sent to engage LTTE troops hidden in a bunker. The scenario is designed for two teams of two players each, with each player controlling a squad.

LTTE: After decades of violent oppression of the Eelam nation, and after several years of war, the Tamil people finally seem to be gaining an advantage. The ceasefire has allowed the construction of several bunker complexes, and two squads have been sent to prepare this bunker as a staging area for attacks on military bases. Unfortunately, the Army has located the bunker and has sent an assault team to destroy it. The LTTE squads must hold the bunker and fend off any attacks. The LTTE set up in the bunker.

LTTE Units:

Number	Quality	Weapons
First Squad		
3	Line	AK-47
1	Green	RP 46
1	Green	RPK
3	Militia	AK-47

Second Squad

3	Line	AK-47
2	Green	L7A2
3	Green	AK-47
1	Militia	M-870 with 30 shells "00"

Ammunition: All combatants with AK-47s carry 6 magazines FMJ. RP 46 and L7A2 gunners carry 4 belts FMJ, while the RPK gunner carries 2 drums FMJ. All soldiers also carry 4 RGD-5 hand grenades.

The Bunker: The bunker is made from reinforced concrete and the walls have a PF of 1600. For the artillery variant below, the bunker has a BV of 7. Trenches should be treated as field trenches.

Army: The Sri Lankan Army is facing difficult times. It simply does not have the manpower or logistic support to wage a protracted war with the Tamil guerrilla groups. And now the Tamils have built fortifications. The Sri Lankans must clear the bunker of any guerrillas. They set up on the south road.

Army Forces:

Number	Quality	Weapons

First Squad

2	Line	AK-47
1	Green	Bren L4
5	Green	AK-47
1	Green	AK-47, RPG-7V with 10 HEAT.

Second Squad

3	Line	FAL

1	Line	Bren L4
2	Green	FAL
3	Militia	AK-47

Machine-gun section

1	Green	M2HB
2	Green	FAL

Ammunition: All combatants with AK-47s or FALs carry 6 magazines FMJ. Bren gunners carry 10 magazines FMJ, while the machine-gun section carries 5 belts FMJ for the M2HB. All soldiers also carry 4 RGD-5 hand grenades.

Variant: Normally, fortifications are assaulted after they have been pounded to dust by artillery. This variant gives the Army players access to a single off-board M-37 82 mm Mortar and up to 40 rounds of HE. The Forward Observer is the leader (Line) of the first squad who carries a backpack radio.

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Urban Terror

In any war, civilians suffer. But in the Sri Lankan war, civilians are made primary targets simply because of their ancestry. The war has spawned a mass of vigilante actions and terrorist attacks, with civilians being slaughtered in retaliation for the other side's atrocities. Tamils kill Sinhalese and Sinhalese kill Tamils and Muslims.

In some cases, the authorities have been accused of standing by while the terrorists carry out their attack as the IPKF was during its fighting with Tamils. Sometimes, the authorities are even accused of assisting the terrorists as the Army and police were accused following the 1983 massacres. In recent years, however, the Sri Lankan authorities have been striving to stop the terrorism, regardless of who the terrorists are.

In this scenario, the Army faces off against the terrorists in a Hindu Temple on the outskirts of Colombo. The Army must try to rescue the hostages inside the bank and kill the terrorists, while the terrorists must somehow try to escape.

This is a fairly straightforward hostage scenario and is excellent for learning Initiative and Morale rules. Players who wish to try negotiation between the terrorists and the military should use communications guidelines in the Initiative rules (”PCCS” Section 5.5).

Terrorists: The Terrorists are Sinhalese Janatha Vinukthi Peramuna (JVP) who have attacked the Hindu temple in retaliation for an LTTE attack on northern fishing villages a week ago. The attack was to terrorize the Tamil civilians and blow up part of the temple. They were cursing the misfortune that had a passing Army patrol force them into a hostage situation. The JVP must now somehow escape. KILLING HOSTAGES IS NOT AN OBJECTIVE. JVP set up inside the Temple.

Terrorist Units:

Number	Quality	Weapons
2	Line	AK-47
3	Green	AK-47
1	Green	AK-47, 2 x 10-lb TNT charges

Ammunition: All soldiers carry 6 magazines FMJ.

Army Units: The Army unit was returning to its base when it saw frightened civilians in the streets surrounding the temple and came under fire from the terrorists inside. Although the situation has been quiet for some time now, the Army knows that it must get the hostages out alive and capture or kill the terrorists. The Army units set up in the street.

Army Units:

Number	Quality	Weapons
2	Line	AK-47
1	Green	Bren L4
6	Green	AK-47

Ammunition: All soldiers with rifles carry 5 magazines FMJ. The Bren gunner carries 3 magazines FMJ. All soldiers also carry 2 RGD-5 hand grenades.

Hostages: There are 5 civilian hostages in the Temple building. They have been forced to lie prone on the floor by the JVP terrorists. Although the JVP objective is not to kill the hostages, threats of killing may be used by JVP forces to hinder Army operations. Manhandling a hostage as a human shield requires double AC for movement.

Victory: A simple point system is used to determine the victory in this scenario. Give the Army player 1 point for every hostage which is rescued unharmed, but deduct 2 points for every terrorist who manages to make it off the map free and alive. If the total is below zero, the Army has suffered a major defeat. If the total is 1 to 3, the scenario is a draw. If the total is above 3, the Army wins the scenario.

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Night of Tigers

A standard tactic used by governments in fighting low intensity conflicts is the patrol. Patrols not only gather

information on insurgent operations, but also serve to display a government presence in the patrolling area. The Sri Lankan Army also mounts sporadic patrolling operations to try to carry the war back to the LTTE and other insurgent groups.

This scenario allows players to plan competing LTTE and Army night patrols. The Army unit must perform a sweep around and through the plantation, while the LTTE unit must intercept them. This is a night scenario with a full moon.

The scenario is designed for two players and a referee, using the Spotting and Large Scale Battlefield rules in ”Advanced Phoenix Command” Sections 7.2 and 7.3. Players plan their itineraries for several minutes on separate maps. They hand these maps to the referee, who resolves spotting and notifies players of combat when it begins.

Terrain Notes: The plantation is covered with mature tea plants. These plants are waist-high shrubs which impede movement. The only non-impeded routes of movement through the plantation grounds are small harvesting paths between the shrubs. These are shown as lines on the plantation map. Harvesting paths are narrow enough to only allow combatants to move in single file.

LTTE: The LTTE squad has received word through its supporters that an Army patrol is operating in the area. The squad must locate the patrol and ambush it as a display of LTTE authority.

LTTE Units:

Number	Quality	Weapons
3	Line	AK-47
2	Green	L7A2
3	Green	AK-47

1	Green	AK-47, RPG-7V with 10 HEAT

Ammunition: All combatants with AK-47s carry 6 magazines FMJ. The L7A2 gunner carries 4 belts FMJ. All soldiers also carry 4 RGD-5 hand grenades.

Army: The Army has received intelligence indicating a Tamil squad is operating in the field either in or near the tea plantation. The Army must perform a sweep of the area and capture or kill the LTTE squad.

Army Units:

Number	Quality	Weapons
2	Line	AK-47
1	Green	Bren L4
5	Green	AK-47
1	Green	AK-47, RPG-7V with 10 HEAT

Ammunition: All soldiers with rifles carry 6 magazines FMJ. The Bren gunner carries 10 magazines FMJ. All soldiers also carry 2 RGD-5 hand grenades.

Victory: The success of an operation like this would be judged by the ARMY and LTTE command on the basis of body counts and kill ratios. Strategic victory is therefore determined as follows. In order to qualify for a chance at strategic victory, the squad must have eliminated or captured at least a quarter of the opposing side. Then, to claim the strategic victory, the squad must have killed or captured more people than it itself lost to death or capture.

Boneyards

In a war noted for its atrocities, it is not surprising that reports of "disappeared ones" have been filtering out of Sri Lanka. The disappeared ones are those people who were detained by government authorities only to vanish in the Sri Lankan prison camps, never to emerge.

Under the 1982 Prevention of Terrorism Act, the government has the authority, among other things, to detain people for up to eighteen months without trial and reports are that it has used this power extensively. There are stories and international reports which tell of torture and threats of reprisals for speaking of the tortures. Other stories tell of Tamil disappeared being buried in mass graves.

In this scenario, a European reporter and a Tamil escort have been searching the cemeteries around the Boosa detention camp for a rumoured boneyard: a mass grave of disappeared. The reporter had just stumbled onto signs of a large unusual burial site when he was spotted by a group of Home Guard. Players take the role of the reporter and his party or the Home Guard to determine whether the reporter manages to get his story out of Sri Lanka or whether he joins the ranks of the disappeared.

Reporters: The reporter is a European photojournalist who is accompanied by two Tamil guides. The reporter must escape off the map alive and with his film and the Tamils must assist him in doing this. The reporter's party sets up beside the mass grave.

Reporter Units:

Number	Quality	Weapons
1	Green	Sig P226
1	Green	M-870
1	Militia	M1949-56

Ammunition: The reporter (Green) carries 3 magazines FMJ for his P226. The shotgunner carries 30 rounds "00", while the rifleman carries 3 magazines FMJ.

Home Guard: The Home Guard units were patrolling the area outside Boosa searching for terrorists when they spotted the trio in the cemetery taking pictures. In order to prevent the Tamil guerrillas from gaining a propaganda victory, the Home guard units must capture or kill the reporter and his guides.

Home Guard Units:

Number	Quality	Weapons
1	Green	AK-47
2	Militia	M-870
4	Militia	MAS-36 Bolt Action Rifles

Weapons Note: The statistics for the MAS-36 are found in the ”World War II WDS”. Players without access to that supplement can substitute the M1949-56 from ”PCCS”, but give the M1949-56s a ROF of 3 and a Cap of 5 to mimic bolt action rifles.

Ammunition: The AK-47 gunner carries 5 magazines FMJ. Shotgunners each carry 30 rounds "00", while the MAS-36 riflemen carry 25 rounds of FMJ each.

Victory: If the reporter manages to exit off the map, he wins a strategic victory. If he, or his guides are able to take the film off the map, the reporter wins a political victory as well. If the Home Guard are able to capture or kill the reporter, they win a strategic victory. If they manage to capture the film, they win a political victory as well.

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In the original Russian Roulette scenario pack, the "Eyes of the World" scenario Was changed from the original manuscript. Reproduced here for the first time is the scenario as it was originally designed.

The scenario, as designed, is a very large scenario, and is better suited for use with the **Miniatures Rules**. Hardcore players can, of course, attempt this with the full **Phoenix Command Small Arms** and **Mechanized** rules.

The Siege of Yeltsin

A group of Gorbachev's most trusted ministers ousted him from power for a short time. They would hold power in the Soviet Union for two days and watch their government and authority crumble around them as the Soviet people refused to heed them. This scenario is based upon these events.

Anatomy of a Coup

Day 1: On August 19, 1991, Army, Fleet, KGB, and Interior Ministry forces moved to surround President Gorbachev's Black Sea residence and place him under house arrest and hold him incommunicado. These units are acting on the orders of an eight-member ruling council, which included KGB Chair Kryuchkov, Defence Minister Yazov, Interior Minister Pugo, Prime Minister Pavlov, and Vice-President Yanayev. The council claims Gorbachev resigned due to health problems and declares a six-month state of emergency. Soviet military and paramilitary forces move quickly to take control of Moscow and cities in the Baltic republics. In Moscow, the ruling council is opposed by reform-minded Russian President Yeltsin who calls the Soviet people to resist the coup.

Day 2: Yeltsin barricades himself in the Russian Parliament building behind rings of civilian supporters and expedient barriers. The equivalent of two tank battalions and supporting motor rifle units are deployed by the coup leaders around Yeltsin's stronghold. Public demonstrations continue and several APCs are destroyed by partisan petrol bombs. Three partisans are killed by nightfall by a panicked APC crew. The military makes it clear to coup leaders that they will not use force against civilians and, in fact, some military units have defected to Yeltsin's side and news footage shows Yeltsin's photograph laminated onto the side of an APC turret. The ruling council gives orders for the arrest of Yeltsin.

In outlying republics, Soviet troops crack down on dissent. Latvia's broadcast station is seized and the Estonian city of Tallinn is under naval blockade and occupied by airborne

forces. Large protests take place in the Ukraine and Moldavia.

Day 3: The coup crumbles as the military refuses to act against Soviet civilians. Without the military and paramilitary forces to back up its decrees, the ruling council is powerless. Military forces pull out of Moscow and the Baltic republics as the coup leaders scatter. Five would be arrested, two would claim parliamentary immunity, and one, Pugo, would commit suicide. President Gorbachev would arrive back in Moscow the next day to return to power in a coalition with Yeltsin and Gorbachev would later resign from the Communist Party.

This scenario takes place on the dawn of the third day of the coup. It is a hypothetical scenario which examines what could have happened if the Soviet military had been ordered to attack the Parliament buildings and to capture Yeltsin, dead or alive. Players take the side of either the junta or Yeltsin as each tries to command fragmenting forces in what could be the deciding battle of the coup. Special rules are provided below covering refusals, civilians, and Adamsite gas attacks.

This is a very complex scenario and team play with a referee is strongly recommended. One set of players should handle infantry combat within the Parliament buildings while the rest handle the armoured combat. In order to make the scenario more realistic, strict use should be made of initiative and morale rules.

Building Notes: All buildings in this area are multistory buildings. Treat each as having 10 floors.

Junta: The ruling council has seen Yeltsin as a major problem which must be neutralized before he rallies the people to tear apart all order in the capital. Elements of a motor rifle regiment have been sent in to break through the barricades to the parliament buildings. A Spetsnaz platoon will be inserted by helicopter to the top of the buildings to work their way down to capture Yeltsin. Airstrikes are not allowed as pilot loyalty is questionable and the junta cannot afford the public backlash from bombing Moscow. Gas grenades have been issued to deal with civilian protestors. The Junta sets up at least 20 hexes away from civilian barricades.

Junta Units:

2 Tank Platoons, each containing

4 T-80 MBT with Professional Crews

2 Motor Rifle Platoons, each containing

3 BMP-2 APC with Professional Crews

3 Motor Rifle Squads (mounted). See below for T.O. & E.

1 Motor Rifle Command Group (mounted). See below for T.O. & E.

1 Spetsnaz Platoon, containing

1 Spetsnaz Command Group. See below for T.O. & E.

3 Spetsnaz Airborne Squads. See below for T.O. & E.

T.O. & E. Motor Rifle Squad:

Number	Quality	Weapons
1	Prof.	AK-74
1	Prof.	AK-74/BG-15 and 10 HEAT
1	Prof.	RPK-74
1	Prof.	AK-74/RPG-7V with 5 HEAT
4	Militia	AK-74

T.O. & E. Motor Rifle Command Group:

Number	Quality	Weapons
1	Prof.	AK-74
1	Prof.	SVD

T.O. & E. Spetsnaz Command Group:

Number	Quality	Weapons
1	Elite	AK-74
1	Elite	AK-74

T.O. & E Spetsnaz Airborne Squad:

Number	Quality	Weapons
4	Elite	AKR

1	Elite	AK-74/BG-15 with 10 HEAT
1	Elite	RPK-74

Ammunition: All soldiers carry 10 magazines FMJ and 4 RGD-5 hand grenades. Each Spetsnaz Squad also has access to 3 RPG-18s. Armoured units have a full ammunition load. All squads and armoured vehicles have 6 Adamsite gas grenades each.

Notes: Only 4 platoons are listed among junta forces. In fact, the junta could have fielded up to two tank battalions against Yeltsin, each with 9 platoons of four tanks each. The accompanying troops from the two motor rifle regiments (MRR) to which the tank battalions belonged would have come to six motor rifle battalions, each with 9 platoons. Each MRR has one tank battalion and three motor rifle battalions. Players wishing to expand the scenario to include these troops are encouraged to do so.

Yeltsin: The Yeltsin forces were barricaded in the Parliament buildings and much of the effort in planning was focussed on protecting the buildings and passive resistance. Now, the Soviet forces are moving in and approaching the civilian ring. Yeltsin's group has little military experience and has only the military units which defected for protection. Yeltsin armored units set up on the Parliament building grounds and infantry units may set up anywhere behind the barricades. Yeltsin himself must set up in the Parliament buildings.

Yeltsin Units:

Armored Units (defectors)

3	T-80 MBT with Professional Crews
5	BMP-2 APCs with Professional Crews
2	BMD-1 ACVs with Professional Crews

Personnel (defectors)

4	Motor Rifle Squads (T.O. & E. identical to Junta squads, above)
2	Motor Rifle Command Groups (T.O. & E. identical to Junta squads, above)
5	OMON Squads (see below for T.O. & E.)

Personnel (civilian)

Number	Role	Quality	Weapons
1	Yeltsin	Militia	None
20	Partisans	Militia	None

10	Partisans	Militia	Karabin 1938g
10	Partisans	Militia	M-870
10	Partisans	Militia	SKS
20	Milicye	Militia	AK-47

T.O. & E. OMON Squad

Number	Quality	Weapons
3	Elite	AK-74
3	Prof.	AK-74

Yeltsin Ammunition: All Soldiers and Milicye carry 10 magazines FMJ and 4 RGD-5 hand grenades. OMON units also have access to 3 RPG-18s per squad.

Partisans with either an SKS or Karabin 1938g have 200 rounds FMJ each. Partisans with M-870 equivalent shotguns carry 50 rounds "00". In addition, each Partisan squad has access to 10 petrol bombs (Molotov cocktails).

Special Rule--Refusal: Every 10 turns, roll 3(6) for each Junta and Yeltsin infantry squad and vehicle crew. If the roll is below 9 plus the squad's highest SL, the squad continues to fight. If the roll is higher than 9 plus the squad's highest SL, the squad refuses to fight and is out of play. They must either surrender or move off the mapboard, depending on the situation, but they will no longer fight.

As an option, players on the Yeltsin side may add +2 to the odds to represent desperation and Yeltsin's oratory skills.

Special Rule--Civilian Supporters: At the start of the coup, the rally around Yeltsin's stronghold had as many as 50,000 civilians in it. At the moment, only 2,000 civilians staff the area around the Parliament buildings. These will act like rioters, but will move in clusters of 100. Each cluster occupies a hex, but can spread out to occupy other hexes as well. These clusters can be simulated by a simple counter or group of counters, rather than placing a figure for every rioter.

Movement of infantry through these clusters is prohibited and any soldiers who try will be attacked. The use of riot gas or deadly force on a cluster permits infantry to move through the cluster at 10 x normal cost. Movement of tracked vehicles is permitted at 4 x normal cost and will cause (10) civilian casualties per hex.

Special Rule--Adamsite Gas: Adamsite gas (Designation DM) is used by the Soviet Union as their primary riot control gas. It is, in fact, classed as a vomiting agent and is much stronger in symptoms than lachrymators like CS riot gas used in Western nations. DM symptoms include tearing, salivation, nasal drip, retching and vomiting, and agonizing gastric and nasal pain. Adamsite is dispersed in burning-type grenades like tear gas, and anyone

exposed to the cloud takes 2 SP for every 2-second phase of exposure. Roll for knockout at the target's KV + 10, but when checking to see how long the incapacitation lasts, use the SP taken times 10. This is severe incapacitation, where the person affected can do nothing but writhe on the ground in pain.

Gas masks provide complete protection against Adamsite. All soldiers carry gas masks and all armoured vehicles are sealed against gas. Yeltsin's forces also have access to 30 gas masks for distribution among partisan and Milicye forces.

Special Rule--Helicopters: Two Mi-17 HIP-H helicopters will deposit the Spetsnaz assault teams anywhere the Junta players choose on the Parliament building roof or grounds. Insertion time is in (10)+5 phases after the start of the scenario. For simplicity, these helicopters provide no air support, cannot be shot down, and are not subject to refusal.

Victory: This is a fight to the death between the two governments claiming control over Russia. For the Junta, Yeltsin must be captured or killed, or the Parliament buildings taken in order for them to claim victory. Yeltsin wins by preventing a Junta victory. The game lasts until all junta units have either refused to fight or been eliminated, or until the junta satisfies its victory conditions.

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WDS: Pistols
WDS: Rifles
WDS: PDWs
WDS: Shotguns
WDS: MG
WDS: AMR
WDS: Explosive
WDS: Exotics
WDS: Anti-Tank

PISTOLS

The weapon data pages will provide data on firearms not covered in the Phoenix Command Weapon Data Supplements. In all cases, the weapon data provided here should be considered unofficial.

Baby Eagle
Colt Delta Elite
Desert Eagle 50 AE
7.65mm DWM Luger 08/20
9mm DWM Luger P-08
9mm DWM Luger 17
7.65mm Gabilondo Ruby
Glock 18
Glock 20
Glock 21
Glock 22
Glock 26
Glock 27
LAR Grizzly 50 AE
M1896 Mauser
Mark 22 Model 0 Hush Puppy
OA 93
SIG 229 .357 SIG
SIG 229 .40 S&W
S&W 1076
Walther P88

Send Comments

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WDS: Pistols
WDS: Rifles
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RIFLES

The weapon data pages will provide data on firearms not covered in the Phoenix Command Weapon Data Supplements. In all cases, the weapon data provided here should be considered unofficial.

Delisle Mk3
Galil AR 5.56mm NATO
HK G-36
HK G-36K
HK MSG-90
H&K PSG1
M21
Model 85 Parker Hale
VG 1-5
Vektor CR21
Winchester M1895 Russian

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WDS: Pistols
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WDS: Shotguns
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PERSONAL DEFENCE WEAPONS and SUBMACHINEGUNS

The weapon data pages will provide data on firearms not covered in the Phoenix Command Weapon Data Supplements. In all cases, the weapon data provided here should be considered unofficial.

ARES FMG
Bizon SMG
Calico 950
Calico 960A
CAR 40 .40 S&W
Carl Gustaf Kulsprutepistol Modell 45
FAMAE
FN P-90
HK MP2000
HK MP5 .40 S&W
HK MP5 10mm
HK MP5 SD3
IDW 10mm
Micro UZI
Sterling L2A3
Sterling L34A1
Steyr AUG 9mmP
Steyr TMP 9mmP
TEC-9

Send Comments
Page last modified: January 04, 2002

WDS: Pistols
WDS: Rifles
WDS: PDWs
WDS: Shotguns
WDS: MG
WDS: AMR
WDS: Explosive
WDS: Exotics
WDS: Anti-Tank

Shotguns

The weapon data pages will provide data on firearms not covered in the Phoenix Command Weapon Data Supplements. In all cases, the weapon data provided here should be considered unofficial.

Benelli M1 Super 90
Beretta M3P
Bernardelli B4
Franchi SPAS 15
Pancor Jackhammer
Ultimate M16A2

Send Comments
Page last modified: January 04, 2002

WDS: Pistols
WDS: Rifles
WDS: PDWs
WDS: Shotguns
WDS: MG
WDS: AMR
WDS: Explosive
WDS: Exotics
WDS: Anti-Tank

MACHINEGUNS and SQUAD AUTOMATIC WEAPONS

The weapon data pages will provide data on firearms not covered in the Phoenix Command Weapon Data Supplements. In all cases, the weapon data provided here should be considered unofficial.

Cetme 5.56 SAW
Ultimax 100

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WDS: Pistols
WDS: Rifles
WDS: PDWs
WDS: Shotguns
WDS: MG
WDS: AMR
WDS: Explosive
WDS: Exotics
WDS: Anti-Tank

HEAVY WEAPONS: ANTI MATERIEL RIFLES

The weapon data pages will provide data on firearms not covered in the Phoenix Command Weapon Data Supplements. In all cases, the weapon data provided here should be considered unofficial.

Barett M82A1
Barett M82A2
Barett M90
BRG-15
.55 inch Boys Anti Tank Rifle
Destroyer 12.7mm
Destroyer 14.5 mm
Solothurn S-18/100
Steyr AMR 15mm
Top Gun 12.7mm

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Page last modified: January 04, 2002

WDS: Pistols
WDS: Rifles
WDS: PDWs
WDS: Shotguns
WDS: MG
WDS: AMR
WDS: Explosive
WDS: Exotics
WDS: Anti-Tank

EXPLOSIVE WEAPONS and LAUNCHERS

The weapon data pages will provide data on firearms not covered in the Phoenix Command Weapon Data Supplements. In all cases, the weapon data provided here should be considered unofficial.

MM1
REA 40mm GL

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WDS: Pistols
WDS: Rifles
WDS: PDWs
WDS: Shotguns
WDS: MG
WDS: AMR
WDS: Explosive
WDS: Exotics
WDS: Anti-Tank

EXOTIC AND CLANDESTINE WEAPONS

The weapon data pages will provide data on firearms not covered in the Phoenix Command Weapon Data Supplements. In all cases, the weapon data provided here should be considered unofficial.

Bang Stick 12 ga.
Cigarette, .22 Calibre
Stinger .22 Calibre

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Page last modified: January 04, 2002

WDS: Pistols
WDS: Rifles
WDS: PDWs
WDS: Shotguns
WDS: MG
WDS: AMR
WDS: Explosive
WDS: Exotics
WDS: Anti-Tank

HEAVY WEAPONS: ANTI TANK

The weapon data pages will provide data on firearms not covered in the Phoenix Command Weapon Data Supplements. In all cases, the weapon data provided here should be considered unofficial.

Javelin AAWS-M
M-136/FFV AT-4

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AAWS-M JAVELIN

Guided Anti-Tank Missile

USA

Data provided by R.J. Andron

Physical Data		Aim Time	Ballistic Data		Range in 20 yard Mech Hexes							
		AC			4	10	20	40	60	80	100	120
W	49.5	6P	HEAT	PEN	7600	7600	7600	7600	7600	7600	7600	7600
				DC	10	10	10	10	10	10	10	10
RT	16			BC0	7900							
ROF	*											
Cap	1											

AW	35 Rnd										
			CC		0.1	0.7	3	8.0	14	23	34
FP	67		AOI	0	2	6	6	6	6	6	6
MR	110		PALM	-3	17	29	40	46	50	53	56
KD	15		BA	7	7	8	8	8	8	8	8
SAB	7		TOF	1	3	7	13	20	27	33	40

Javelin AAWS-M - The Javelin is the US Army's newest AT Missile system. It is a lock-on-before launch system and is self-guided towards the target. This is effectively a "fire-and-forget" system. Designating the target takes 6 Phases of aim time, and the missile will not guide towards the target without this target designation process.

The system consists of a Command Launch Unit (CLU), battery, and missile pod. The CLU sight is a thermal imaging sight capable of operating continuously for 4 hours off the battery.

The gunner acquires/designates the target using the CLU by placing a curser box over the image of the target. Then, the gunner locks the missile's IR seeker head.

The twin stage motor consists of a soft-launch stage and a sustainer stage. The soft launch ejects the missile from the launcher for a low-recoil shoulder launch. This permits the missile to be fired from inside buildings.

The missile when launched, can fly on either a direct attack or a "lofted attack" to strike the less-armored tops of AFVs. The warhead consists of a tandem shaped charge warhead. The above table assumes an AOI for a lofted attack. For a direct attack, use an AOI of 1.

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M-136/FFV AT-4

Rocket Launcher

84mm

USA

Data provided by R.J. Andron

Physical Data		Aim Time		Ballistic Data													
						Range in 2 yard Hexes					Range from Burst						
		AC	ALM			40	100	200	400		0	1	2	3	5	10
L	34	1	-26	HEAT	PEN	4800	4800	4800	4800	PEN	5.2	5.1	4.8	4.6	4.2	3.4
W	14.8	2	-16		DC	10	10	10	10	DC	7	7	7	7	6	6
		3	-10							BSHC	15	3	0	-3	-7	-12
RT	-	4	-8							BC	11h	260	80	47	18	8
ROF	-	5	-6													
		6	-5		AOI	0	0	1	2							

Cap	1	7	-4	BA	10	-3	-12	-22
AW	6.75	8	-3	TOF	3	7	14	28
	Rnd	9	-2					
		10	-1					
MR	600							
KD	230							
SAB	0							

M136/FFV AT-4 - The disposable AT-4 has been adopted for US Army service and is designated M-136.

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Bang Stick

Exotic

12 Gauge

Data provided by R.J. Andron

Physical Data		Aim Time				Ballistic Data Range in 2 yard Hexes											
		AC	ALM			C	1	2	4	6	7	10	15	20	30	40	80
L	42	1	-20	Slug	PEN	5.1	2.5	2.4	2.4	2.3	2.2	2.2	2.0	1.9	1.6	1.2	1.0
W	8.4	2	-13		DC	8	8	8	8	8	8	8	8	8	7	7	5
		3	-11														
RT	30	4	-11	Shot	PEN	5.1	1.1	1.0	1.0	1.0	0.9	0.9	0.8	0.7	0.6	0.5	0.3
ROF	*	5	-10	(00)	DC	8	3	3	3	3	2	2	2	2	1	1	1
					SALM		-5	-2	2	5	7	9	12	15	18	21	25
Cap	7			(12)	BPHC			*11	*10	*6	*3	*2	*1	40	18	5	0

AW	0.13 Rnd		PR	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.5	0.8	1.1	2.0
KD	25		BA	61	51	41	36	31	28	23	18	13	9	-1
SAB	12		TOF	0	0	0	0	0	0	1	1	1	2	4

Bang Stick - This device is designed for use by divers as a means of wounding and driving off sharks. The shotgun round is placed onto the striking tip and fired when the striking tip makes contact with the target (use the "C" column to determine damage). The design can and has been modified into concealed weapons. Such shotguns have been concealed in handlebars, shock absorbers, highway flares, flashlights, and clubs. The aim time data assumes an expedient grip or handle has been affixed. Normal operation of the weapon is done using the rules for a hand-to-hand strike.

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Cigarette, .22 Calibre

Clandestine Weapon

.22 LR

USA

Data Provided by R.J. Andron

Physical Data		Aim Time		Ballistic Data Range in 2 yard Hexes					
		AC	ALM			2	4	7	10
L	2.75	1	-25	FMJ	PEN	0.6	0.5	0.5	0.4
W	0.2	2	-20		DC	1	1	1	1
		3	-12						
RT	*	4	-8	JHP	PEN	0.6	0.5	0.5	0.4
ROF	-				DC	2	1	1	1
Cap	1			AP	PEN	0.8	0.8	0.7	0.6

AW	0.01 Rnd			DC	1	1	1	1	
KD	1			BA	20	12	3	-	
SAB	5			TOF	1.5	2.2	4.3	7.4	

Cigarette, .22 Calibre - This is the smallest type of Pen Gun available and is commonly camouflaged as a cigarette. Pen guns, like hideout weapons, are intended for use as concealable escape aids. Because of the weapon's light weight, the gun is intended to be thrown backwards by the recoil, and the proper stance is to place the shooter's body perpendicular to the line of fire and maintain a relaxed grip.

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Stinger .22 Calibre

Clandestine Weapon

.22 LR

USA

Data Provided by R.J. Andron

Physical Data		Aim Time		Range in 2 yard Hexes					
		AC	ALM			2	4	7	10
L	3.2	1	-16	FMJ	PEN	0.5	0.5	0.4	0.4
W	0.5	2	-12		DC	3	3	2	1
		3	-8						
RT	30	4	-6	JHP	PEN	0.5	0.5	0.4	0.4
ROF	-				DC	4	4	3	2

Cap	1		AP	PEN	0.7	0.7	0.6	0.5	
AW	0.01			DC	3	3	2	1	
	Rnd								
KD	1			BA	20	12	3	-	
SAB	5			TOF	1.6	2.3	4.7	8	

Stinger .22 Calibre - Hideout weapons are intended to be carried clandestinely by intelligence operatives or saboteurs, and are intended to be used primarily as escape devices. This version, the Stinger, was used by the CIA, and was marketed to civilians as the "Single Shot Survival Weapon." The Stinger has a sealed barrel to keep out dirt and other materials during storage. The seal is blown open on firing.

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MM-1

Grenade Launcher

40mm

USA

Data provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes			Range from Burst						
		AC	ALM			40	100	200		0	1	2	3	5	10
L	34	1	-28	HEAT	PEN	106	106	106	PEN	1.6	1.4	1.0	0.7	0.4	
W	20	2	-18		DC	10	10	10	DC	1	1	1	1	1	
		3	-10						BSHC	*2	47	11	4	1	
RT	66	4	-8						BC	241	71	23	12	5	1
ROF	*1	5	-6												
		6	-5	HE	PEN	2	2	2	PEN	1.4	1.2	0.8	0.6	0.3	

Cap	12	7	-3	DC	10	10	10	DC	1	1	1	1	1	
AW	0.51							BSHC	*3	73	17	7	2	
	Rnd							BC	250	74	23	12	5	1
				AOI	0	1	4							
MR	200			MA	1	3	5							
KD	15			BA	23	10	1							
SAB	7			TOF	11	33	80							

MM-1 40mm Grenade Launcher-Is a 12-shot wind up grenade launcher that will fire full-auto.

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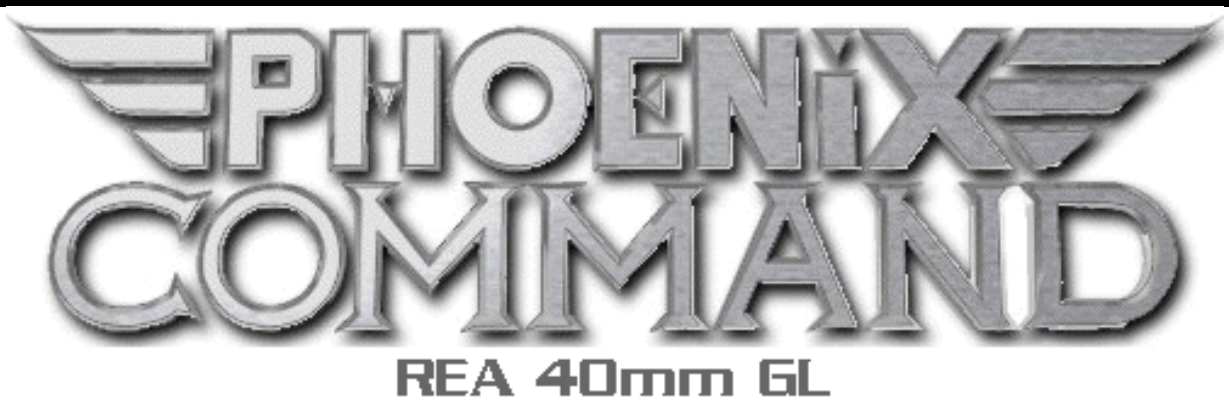

REA 40mm GL

Grenade Launcher

40mm

South Africa

Data provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data Range in 2 yard Hexes					Range from Burst						
		AC	ALM			40	100	200		0	1	2	3	5	10
L	34	1	-23	HEAT	PEN	106	106	106	PEN	1.6	1.4	1.0	0.7	0.4	
W	8	2	-12		DC	10	10	10	DC	1	1	1	1	1	
		3	-9						BSHC	*2	47	11	4	1	
RT	10	4	-7						BC	241	71	23	12	5	1
ROF	*	5	-6												
		6	-4	HE	PEN	2	2	2	PEN	1.4	1.2	0.8	0.6	0.3	

Cap	6	7	-3		DC	10	10	10		DC	1	1	1	1	1
AW	4	8	-2							BSHC	*3	73	17	7	2
	Mag									BC	250	74	23	12	5	1
					AOI	0	1	4							
MR	200				MA	1	3	5							
KD	15				BA	23	10	1							
SAB	7				TOF	11	33	80							

REA 40mm AGL-Is a prototype lightweight clip fed grenade launcher. It uses lightweight composite materials in its construction.

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Barett M82A1 "Light Fifty"

Anti-Materiel Rifle

.50 Browning

USA

Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes									
		AC	ALM			10	20	40	70	100	200	300	400	600	800
L	58	1	-32	FMJ	PEN	40	39	37	35	34	28	23	19	15	12
W	35	2	-22		DC	10	10	10	10	10	10	10	10	10	9
		3	-15												
RT	10	4	-9	JHP	PEN	38	37	36	34	32	27	22	19	15	12
ROF	*	5	-7		DC	10	10	10	10	10	10	10	10	10	10
		6	-5												
Cap	11	7	-3	AP	PEN	56	55	53	50	47	39	33	27	21	16

AW	3.5	8	-1	DC	10	10	10	10	10	10	10	10	9	9
	Mag	9	1											
		10	2											
KD	45	12	5	BA	64	58	50	43	39	33	28	26	22	19
SAB	6			TOF	0	0	1	2	2	5	8	11	16	22

M82A1 Light Fifty .50 Browning-The light fifty also known as the Barrett, is a simple rugged weapon designed for sniping vulnerable high tech equipment at long ranges.

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Barett M82A2 "Light Fifty"

Anti-Materiel Rifle

.50 Browning

USA

Data Provided by Greg Brovane

Physical Data		Aim Time				Ballistic Data Range in 2 yard Hexes									
		AC	ALM			10	20	40	70	100	200	300	400	600	800
L	46	1	-28	FMJ	PEN	40	39	37	35	34	28	23	19	15	12
W	29	2	-19		DC	10	10	10	10	10	10	10	10	10	9
		3	-11												
RT	10	4	-8	JHP	PEN	38	37	36	34	32	27	22	19	15	12
ROF	*	5	-7		DC	10	10	10	10	10	10	10	10	10	10
		6	-5												
Cap	11	7	-3	AP	PEN	56	55	53	50	47	39	33	27	21	16

AW	3.5	8	-1	DC	10	10	10	10	10	10	10	10	9	9
	Mag	9	1											
		10	2											
KD	45	12	4	BA	64	58	50	43	39	33	28	26	22	19
SAB	6			TOF	0	0	1	2	2	5	8	11	16	22

M82A2 Light Fifty .50 Browning-This is a semi-auto bullpup configured weapon. The weapon is designed to be held like a bazooka and fired from the shoulder. The weapon was probably made during the Afghanistan conflict to engage helicopters. The gun comes standard with a scope.

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Barett M90 "Light Fifty"

Anti-Materiel Rifle

.50 Browning

USA

Data Provided by Greg Brovane

Physical Data		Aim Time				Ballistic Data Range in 2 yard Hexes									
		AC	ALM			10	20	40	70	100	200	300	400	600	800
L	46	1	-28	FMJ	PEN	40	39	37	35	34	28	23	19	15	12
W	23.4	2	-19		DC	10	10	10	10	10	10	10	10	10	9
		3	-11												
RT	10	4	-8	JHP	PEN	38	37	36	34	32	27	22	19	15	12
ROF	3	5	-7		DC	10	10	10	10	10	10	10	10	10	10
		6	-5												
Cap	5	7	-2	AP	PEN	56	55	53	50	47	39	33	27	21	16

AW	1.5	8	-1	DC	10	10	10	10	10	10	10	10	9	9
	Mag	9	1											
		10	2											
KD	45	12	5	BA	64	58	50	43	39	33	28	26	22	19
SAB	6			TOF	0	0	1	2	2	5	8	11	16	22

M90 Light Fifty .50 Browning-Is a shorter lighter bullpup configured weapon. The weapon is bolt-action and uses a more efficient muzzle brake to lower recoil down. The gun comes standard with a bipod and scope.

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BRG-15

Anti-Materiel Rifle

15mm Milo

Belgium

Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data Range in 2 yard Hexes												
		AC	ALM			10	20	40	70	100	200	300	400	600	800	1000
L	85	1	-37	AP	PEN	116	115	112	108	103	90	78	68	50	37	27
W	242	2	-27		DC	10	10	10	10	10	10	10	10	10	10	10
		3	-21		TOF	0	0	1	1	2	4	6	9	15	24	32
RT	40	4	-17													
ROF	*5	5	-14	SABOT	PEN	238	238	237	235	234	228	223	218	209	199	190
		6	-10		DC	9	9	9	9	9	9	9	9	9	9	9
Cap	140	7	-8		TOF	0	0	1	1	2	3	5	7	10	14	17
AW	110	9	-5													
	Mag	10	-4													

		12	-1												
KD	94	15	0	MA	0.2	0.3	0.6	1	2	3	5	6	8	9	11
SAB	3			BA	44	40	37	33	30	25	22	20	16	12	8

BRG-15 15mm Milo-This unusual is made by FNC in Belgium. This weapon fires a 15.5mm round and will also fire a 7.62 Tungsten core SABOT. The weapon is a dual feed weapon, being fed from two 70 round bins. The rounds are loaded into a bin similar to how a aircraft gun is loaded. The weapon is still in prototype and I don't know if it has entered production.

Send Comments

Page last modified: February 09, 2001

.55 inch Boys Anti Tank Rifle Mark 1

Anti-Materiel Rifle

.55 ATR

United Kingdom

Data Provided by Eero Juhola

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	63.5	1	-30	AP	PEN	132	123	111	95	82	50	30	18
W	36.6	2	-20		DC	10	10	10	10	10	10	10	10
		3	-14										
RT	8	4	-10										
ROF	3	5	-8										
		6	-6										

Cap	5	7	-5									
AW	1.3	8	-4									
	Box	9	-3									
		10	-2									
KD	50	11	-2	BA	64	57	49	42	37	28	23	19
SAB	4	12	0	TOF	0	0	1	1	2	4	7	9

.55 inch Boys Anti Tank Rifle Mark 1

The Boys ATR was a large rifle with a padded rifle stock, pistol grip, an over-the-barrel magazine remiscent of the Bren machine gun and an integrated support leg which counts as a bipod. Named after one of its principal designers Captain Boys, this gun was the primary anti-tank weapon of British infantry until 1941, when it was replaced by the PIAT shaped charge weapons. It was widely used in campaigns against the Axis in France and North Africa in the early part of the war. While effective against the 1930s tanks it was designed to counter, it was - due to its bolt-action design - slow to operate and outclassed by later models such as the PzKpfw III. However the ATR could break the track of any tank.

> *"Quickly the men moved around few more corners in the trench. 'We'll set up right here !' the anti-tank gunner ordered the lieutenant. They peeked over the brim of the trench. The second tank stood still, its turret rotating slowly. 'It's that one's turn now,' the man said with conviction.*
>
> *When the turret had rotated so that the tank's gunner could not see their location, the man barked: 'Now !'*
>
> *The men lifted the anti-tank rifle into position in a corner of the trench. It only took a second. The gunner hung onto the rear of the rifle and sighted on the target. That took a couple of seconds."*

When the Winter War erupted in late 1939 international public sentiment

was very much on the Finnish side. The British government donated two hundred Boys ATRs with the express wish that thirty of them would be given to Swedish volunteers. The rifles were a huge success against Soviet tanks of pre-war design which had been built to withstand small-arms fire only.

> *"Bang, bang, bang, bang the anti-tank rifle fired four times. Raetpalo's ears were ringing viciously. Blue smoke hung above the corner in the trench. Loud smacks were heard from the direction of*
>
> *the tank, proving that at least two rounds had struck it. Raetpalo peered at the tank. He could make out two holes in its side where the rounds had penetrated. Suddenly the hatches were flung open. The tank stood still, its engine having stalled, and it was slowly beginning to emit smoke. The engine came to life again at high revs and the volume of smoke increased, now almost completely hiding the tank. Slowly the machine began to crawl again, now headed back toward the Lähde road where it had come from.*
>
> *'They've had enough. They're fleeing !' Raetpalo was overjoyed. After about a hundred meters there was a loud bang from the tank. It stopped and burst into flames. A smile of victory was on the lips of the tank killer - for that is what these anti-tank men were called - as he stated: 'That was my sixth bullseye.'*
>
> *Combat between a Boys gunner and a thirty-ton T-28 tank. Mannerheim Line, February 1940*

In late 1940 Finland bought 200 Boys ATRs from German war booty stocks. The rifles were used on the front in the beginning of the Continuation War in 1941 but were for the most part withdrawn by 1943. The remaining 300 examples were kept in storage until the Fifties when they were sold to collectors.

Send Comments

Page last modified: February 09, 2001

Destroyer Heavy Sniping Rifle

Anti-Materiel Rifle

12.7mm x 107mm

Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes									
		AC	ALM			10	20	40	70	100	200	300	400	600	800
L	60	1	-32	FMJ	PEN	45	44	43	40	38	32	27	23	19	14
W	37.4	2	-21		DC	10	10	10	10	10	10	10	10	10	9
		3	-15												
RT	8	4	-9	JHP	PEN	43	42	41	39	37	31	26	22	16	11
ROF	*	5	-7		DC	10	10	10	10	10	10	10	10	10	10
		6	-5												
Cap	10	7	-3	AP	PEN	63	32	60	57	54	45	38	32	23	18

AW	3.8	8	-2	DC	10	10	10	10	10	10	10	10	9	9
	Mag	9	0											
		10	2											
KD	49	12	4	BA	65	58	51	45	40	34	28	25	21	18
SAB	7			TOF	0	0	1	2	2	4	6	9	15	21

Destroyer 12.7x107mm-This is a heavy sniper rifle that fires the Soviet 12.7x107mm round. It comes standard with a bipod and muzzle brake.

Send Comments

Page last modified: February 09, 2001

Destroyer Heavy Sniping Rifle

Anti-Materiel Rifle

14.5 mm

Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes									
		AC	ALM			10	20	40	70	100	200	300	400	600	800
L	60	1	-32	API-T	PEN	122	118	114	107	103	87	73	62	44	31
W	37.5	2	-22		DC	10	10	10	10	10	10	10	10	10	10
		3	-15												
RT	10	4	-9	AP-T	PEN	185	180	175	167	160	136	116	99	72	53
ROF	*	5	-7		DC	10	10	10	10	10	10	10	10	10	10
		6	-5												
Cap	5	7	-3												

AW	2.2	8	-1												
	Mag	9	1												
		10	2												
KD	70	12	4	BA	64	60	54	48	42	33	28	24	18	14
SAB	12			TOF	0	0	1	2	2	4	6	9	14	20

Destroyer Heavy Sniping Rifle 14.5mm-This is a modern rifle built to fire the huge 14.5mm round. This is a improved model of the Destroyer rifle. Needless to say the weapon would have a fearsome recoil. The gun comes standard with a bipod and scope

Send Comments

Page last modified: February 09, 2001

Solothurn S-18/100

Anti-Materiel Rifle

20mm x 105mm Short Solothurn

Switzerland

Data Provided by R.J. Andron

Physical Data		Aim Time				Ballistic Data Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	69.3	1	-35	AP	PEN	70	66	60	51	44	27	16	9.8
W	99.2	2	-25		DC	10	10	10	10	10	10	10	10
		3	-18										
RT	8	4	-15										
ROF	*	5	-11										
		6	-8										

Cap	10	7	-5									
AW	3	8	-3									
	Mag	9	-1									
		10	0									
KD	122	12	2	BA	64	60	54	48	42	33	28	24
SAB	10	14	5	TOF	0	1	1	2	3	6	10	13

Solothurn S-18/100 - The Solothurn S-18/100 was an anti-material rifle developed in the interwar years in Switzerland and was adopted by Italy, Hungary, and Switzerland. The recoil-operated semiautomatic rifle fired from an integral bipod and rear monopod. The Solothurn was one of the more powerful anti-tank rifles of its era, and was the forerunner of the German PzB41.

Send Comments

Page last modified: February 11, 2001

Steyr AMR 15mm

Anti-Materiel Rifle

15mm AMR

Austria

Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data Range in 2 yard Hexes									
		AC	ALM			40	70	100	200	300	400	600	800	1000
L	80	1	-37	TF	PEN	463	458	452	435	418	401	370	341	314
W	44	2	-25		DC	9	9	9	9	8	8	8	8	8
		3	-18											
RT	8	4	-15											
ROF	*	5	-11											
		6	-8											
Cap	8	7	-5											

AW	4.2	8	-3										
	Mag	9	-1										
		10	0										
KD	54	12	2	BA	37	33	30	25	22	20	16	12	8
SAB	6	14	5	TOF	0	1	1	3	4	5	8	12	15

AMR 15mm-This is a unusual weapon made by Steyr to knock out vulnerable high tech equipment at long ranges. The weapon is not intended to be used against personnel that is why Steyr called it the AMR(Anti-material Rifle). The weapon fires a special cartridge that is part plastic that carries a 5.5mm 36-gram tungsten flechette. The flechette has a muzzle velocity of 4920 ft/sec (1500 m/sec). At 800 meters the flechette has penetrated 40mm rolled steel armor and then shattered to give severe fragmentation damage. The barrel is smoothbore. The recoil force is absorbed by a long recoil movement, multi-baffle muzzle brake, and the entire barrel recoils inside a sleeve type hydro-pneumatic recoil system that is usually found on artillery not rifles. All this cuts felt recoil to just a little more than that of a conventional service rifle. The gun comes standard with a bipod and scope.

Send Comments

Page last modified: February 09, 2001

Top Gun 12.7mm x 107mm

Anti-Materiel Rifle

12.7mm x 107mm

Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes									
		AC	ALM			10	20	40	70	100	200	300	400	600	800
L	54	1	-29	FMJ	PEN	44	43	42	39	37	31	26	22	19	14
W	26.3	2	-19		DC	10	10	10	10	10	10	10	10	10	9
		3	-14												
RT	8	4	-8	JHP	PEN	42	41	40	38	36	30	25	22	19	14
ROF	-	5	-7		DC	10	10	10	10	10	10	10	10	10	10
		6	-5												
Cap	1	7	-3	AP	PEN	62	61	59	56	53	44	37	31	22	18

AW	0.34	8	-2	DC	10	10	10	10	10	10	10	10	10	9
	Rnd	9	0											
		10	2											
KD	49	12	4	BA	64	57	50	44	39	33	27	24	20	17
SAB	7			TOF	0	0	1	2	2	4	6	9	15	21

Top Gun 12.7x107mm-This is a heavy sniper rifle that fires the Soviet 12.7x107mm round. The weapon is a single shot gun and needs to reloaded after each shot. The gun comes standard with a bipod and scope.

Send Comments

Page last modified: February 09, 2001

CETME

Squad Automatic Weapon

5.56 mm NATO

Spain

Data provided by Matthew A. Crump

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	41	1	-26	FMJ	PEN	15	15	14	12	11	7.0	4.6	3.0
W	18.4	2	-18		DC	6	6	6	6	5	4	3	2
		3	-11										
RT	14	4	-10	JHP	PEN	15	14	13	12	10	6.7	4.4	2.9
ROF	*10	5	-8		DC	8	8	7	7	7	6	5	3
		6	-7										

Cap	200	7	-6	AP	PEN	22	21	19	17	15	9.9	6.5	4.3
AW	6.9	8	-4		DC	6	6	6	5	5	4	3	2
	Blt	9	-3										
		10	-2		MA	0.4	0.8	2	3	4	8	12	16
KD	4	12	-1		BA	61	53	44	37	32	22	17	13
SAB	3				TOF	0	0	1	1	2	5	8	11

CETME Squad Automatic Weapon - Squad Automatic Weapon of the Spanish Army. This weapon is a development of the MG42/MG3 series, and looks much like those weapons. It also shares their tremendous rate of fire, and the light weight of the smaller ammunition allows more to be carried than with its larger cousins. The most significant disadvantage is that its light weight makes it difficult to control.

Send Comments

Page last modified: February 03, 2001

Ultimax 100 SAW

Squad Assault Weapon

5.56mm NATO

Singapore

Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	40	1	-25	FMJ	PEN	15	15	13	12	11	6.6	4.2	2.6
W	15	2	-15		DC	7	7	7	6	6	4	2	1
		3	-10										
RT	14	4	-8	JHP	PEN	14	14	13	11	10	6.3	3.9	2.5
ROF	*5	5	-6		DC	8	8	8	8	7	6	4	2
		6	-5										

Cap	100	7	-4	AP	PEN	21	20	19	17	15	9.2	5.8	3.6
AW	4	8	-3		DC	6	6	6	6	5	4	2	1
	Drm	9	-2										
		10	-1		MA	0.2	0.3	0.7	1	2	3	5	7
KD	4	11	0		BA	60	51	42	35	30	20	15	11
SAB	3				TOF	0	0	1	2	2	6	11	18

Ultimax 100 5.56mm NATO-This weapon is manufactured by CIS of Singapore. It was originally made to be one of the contenders for the U.S. Army's SAW (Squad Automatic Weapon). The Minimi was selected before the Ultimax design was perfected. The weapon is used by Singapore armed forces and several Far East nations, were it has performed well. The weapon is easily controlled from prone, hip or shoulder. The weapon will accept 20, 30 or the special plastic 100 round drum. The weapon uses a quick-change heavy barrel that can survive 500 continuous rounds without heat damage. The weapon comes standard with a bipod.

Send Comments

Page last modified: February 03, 2001

Benelli M1 Super 90

Shotgun

12 Gauge

Italy

Data provided by Greg Brovane

Physical Data		Aim Time				Ballistic Data Range in 2 yard Hexes										
		AC	ALM			1	2	4	6	7	10	15	20	30	40	80
L	42	1	-23	Slug	PEN	7.7	7.7	7.6	7.5	7.5	7.4	7.3	7.2	6.9	6.7	5.7
W	8.4	2	-12		DC	10	10	10	10	10	10	10	10	10	9	9
		3	-9													
RT	30	4	-7	Shot	PEN	5.4	1.6	1.5	1.5	1.4	1.4	1.3	1.2	1.1	9.0	0.5
ROF	*	5	-6	(00)	DC	8	3	3	3	3	3	2	2	2	2	1
		6	-4		SALM	-14	-9	-4	-1	1	2	5	7	10	12	17

Cap	7	7	-3	(11)	BPHC		*11	*10	*9	*7	*5	*2	*1	62	35	8
AW	0.13	8	-2		PR	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.7
	Rnd															
KD	25				BA	67	58	48	42	38	35	29	25	19	15	5
SAB	12				TOF	0	0	0	0	0	0	1	1	1	2	4

Benelli M1 Super 90 12Gauge-This is a semi-automatic shotgun made by Benelli firearms in Italy.

Send Comments

Page last modified: February 09, 2001

Beretta M3P

Shotgun

12 Gauge

Italy

Data provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data Range in 2 yard Hexes												
		AC	ALM			1	2	4	6	7	10	15	20	30	40	80
L	38/46	1	-23	Slug	PEN	7.7	7.7	7.6	7.5	7.5	7.4	7.3	7.2	6.9	6.7	5.7
W	8.4	2	-12		DC	10	10	10	10	10	10	10	10	10	9	9
		3	-9													
RT	8	4	-7	Shot	PEN	5.4	1.6	1.5	1.5	1.4	1.4	1.3	1.2	1.1	9.0	0.5
ROF	*	5	-6	(00)	DC	8	3	3	3	3	3	2	2	2	2	1
		6	-4		SALM	-14	-9	-4	-1	1	2	5	7	10	12	17

Cap	5	7	-3	(11)	BPHC		*11	*10	*9	*7	*5	*2	*1	62	35	8
AW	1.1	8	-2		PR	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.7
	Mag	9	-1													
KD	25				BA	67	58	48	42	38	35	29	25	19	15	5
SAB	12				TOF	0	0	0	0	0	0	1	1	1	2	4

Beretta M3P 12 Gauge-This is a semi-automatic clip feed shotgun.

Send Comments

Page last modified: February 09, 2001

Bernardelli B4

Bernardelli B4

Shotgun

12 Gauge

Italy

Data provided by Greg Brovane

Physical Data		Aim Time				Ballistic Data Range in 2 yard Hexes										
		AC	ALM			1	2	4	6	7	10	15	20	30	40	80
L	29/38	1	-23	Slug	PEN	7.7	7.7	7.6	7.5	7.5	7.4	7.3	7.2	6.9	6.7	5.7
W	8.2	2	-12		DC	10	10	10	10	10	10	10	10	10	9	9
		3	-9													
RT	8	4	-7	Shot	PEN	5.4	1.6	1.5	1.5	1.4	1.4	1.3	1.2	1.1	9.0	0.5
ROF	*	5	-6	(00)	DC	8	3	3	3	3	3	2	2	2	2	1
		6	-4		SALM	-14	-9	-4	-1	1	2	5	7	10	12	17
Cap	8	7	-3	(11)	BPHC		*11	*10	*9	*7	*5	*2	*1	62	35	8

AW	1.8	8	-2	PR	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.3	0.4	0.7
	Mag	9	-1												
KD	25			BA	67	58	48	42	38	35	29	25	19	15	5
SAB	12			TOF	0	0	0	0	0	0	1	1	1	2	4

Bernardelli B4 12 Gauge-Is a tough semi-automatic clip feed shotgun. The gun has a backup pump-action.

Send Comments

Page last modified: February 09, 2001

Franchi SPAS 15

Franchi SPAS-15

Shotgun

12 Gauge

Italy

Data provided by R.J. Andron

Physical Data		Aim Time		Ballistic Data Range in 2 yard Hexes												
		AC	ALM			1	2	4	6	7	10	15	20	30	40	80
L	36	1	-23	Slug	PEN	6.9	6.9	6.8	6.7	6.7	6.6	6.5	6.4	6.1	6.0	5.1
W	7	2	-14		DC	10	10	10	10	10	10	10	10	10	10	10
		3	-10													
RT	8	4	-9	Shot	PEN	4.8	1.5	1.5	1.4	1.4	1.3	1.2	1.2	1.0	0.9	0.5
ROF	*	5	-7	(000)	DC	8	3	3	3	3	3	2	2	2	2	1
		6	-6		SALM	-13	-8	-3	0	2	4	7	9	12	14	19

Cap	6	7	-4	(8)	BPHC	*8	*7	*7	*6	*4	*2	*1	55.0	24.0	12.0	1
AW	1.3	8	-3		PR	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.5	1.0
	Mag	9	-2													
		10	-1													
KD	23	11	0		BA	71	61	52	46	42	39	33	29	23	19	9
SAB	8				TOF	0	0	0	0	0	0	1	1	1	2	4

Franchi SPAS 15 - This 12-ga. shotgun feeds from a box magazine, and has a switchable semiautomatic/pump action. Limited to military and police use in most nations. May be in the hands of a few private collectors in Canada and the United States before imports were banned in those two countries.

Send Comments

Page last modified: February 03, 2001

Pancor Jackhammer 12 Gauge

Shotgun

12 Gauge

USA

Data provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data Range in 2 yard Hexes												
		AC	ALM			1	2	4	6	7	10	15	20	30	40	80
L	32	1	-24	Slug	PEN	7.0	7.0	6.9	6.9	6.8	6.7	6.6	6.5	6.3	6.0	5.2
W	11.2	2	-14		DC	10	10	10	10	10	10	9	9	9	9	8
		3	-10													
RT	10	4	-8	Shot	PEN	5.4	1.6	1.5	1.5	1.4	1.4	1.3	1.2	1.1	9.0	0.5
ROF	*4	5	-7	(00)	DC	8	3	3	3	3	3	2	2	2	2	1
		6	-5		SALM	-13	-8	-3	0	2	4	7	9	12	14	19
Cap	10	7	-4	(11)	BPHC		*11	*10	*9	*5	*3	*2	93	42	23	5

AW	2.2	8	-3	PR	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.9
	Mag	9	-2												
		10	-1	MA	0.2	0.2	0.5	0.7	0.8	1	2	2	3	5	7
KD	23	12	0	BA	67	58	48	42	38	35	29	25	19	15	5
SAB	9			TOF	0	0	0	0	0	0	1	1	1	2	4

Jackhammer 12 Gauge-Is a full-auto shotgun using plastic construction. The weapon has a two-stage trigger for semi-auto our full auto.

Send Comments

Page last modified: February 09, 2001

Ultimate/M16A2

Shotgun

12 Gauge

USA

Data provided by Greg Brovane

Physical Data		Aim Time				Ballistic Data Range in 2 yard Hexes										
		AC	ALM			1	2	4	6	7	10	15	20	30	40	80
L	39	1	-26	Slug	PEN	7.0	7.0	6.9	6.9	6.8	6.7	6.6	6.5	6.3	6.0	5.2
W	14.8	2	-15		DC	10	10	10	10	10	10	9	9	9	9	8
		3	-9													
RT	26	4	-8	Shot	PEN	5.4	1.6	1.5	1.5	1.4	1.4	1.3	1.2	1.1	9.0	0.5
ROF	2	5	-6	(00)	DC	8	3	3	3	3	3	2	2	2	2	1
		6	-5		SALM	-13	-8	-3	0	2	4	7	9	12	14	19
Cap	5	7	-4	(11)	BPHC		*11	*10	*9	*5	*3	*2	93	42	23	5

AW	0.13	8	-3	PR	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.9
	Rnd	9	-2												
		10	-1												
KD	23	12	0	BA	67	58	48	42	38	35	29	25	19	15	5
SAB	10			TOF	0	0	0	0	0	0	1	1	1	2	4

Ultimate/M16A2 12 gauge-Is a heavily modified Remington 870 that is designed to be attached under a M16. The shotgun has no grip or stock so firing it separate is dangerous.

Send Comments

Page last modified: February 09, 2001

ARES FMG

Personal Defence Weapon

9mmP

USA

Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	20	1	-21	FMJ	PEN	2.3	2.1	1.8	1.4	1.1	0.5	0.2	0.1
W	6.4	2	-11		DC	3	3	3	2	1	1	1	1
		3	-9										
RT	8	4	-7	JHP	PEN	2.2	2.0	1.7	1.3	1.0	0.4	0.2	0.1
ROF	*6	5	-6		DC	5	4	4	3	2	1	1	1
		6	-5										

Cap	32		AP	PEN	3.2	3	2.5	1.9	1.5	0.6	0.3	0.1
AW	1.4			DC	3	3	2	2	1	1	1	1
	Mag											
				MA	0.3	0.5	1	2	3	5	8	11
KD	3			BA	46	37	28	21	16	7	1	-2
SAB	3			TOF	0	1	2	4	6	13	23	32

ARES Folding SMG 9mmP-This SMG is manufactured by ARES Inc. in the U.S.. It is designed to be a compact concealable SMG. The gun can be folded to about half the size of a standard sheet of paper. The gun can only be folded when 20-round magazines that weigh 1 pound are used. Requires 8 AC to fold or unfold.

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Page last modified: February 03, 2001

Bizon SMG

Submachine Gun

9mm Makarov

Russia

Data provided by R.J. Andron

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	26/17	1	-21	FMJ	PEN	1.7	1.6	1.3	0.9	0.6	0.1		
W	5.5	2	-11		DC	3	3	2	2	1	1		
		3	-10										
RT	8	4	-9	JHP	PEN	1.7	1.4	1.1	0.9	0.6	0.1		
ROF	*6	5	-8		DC	4	3	3	2	1	1		
		6	-7										

Cap	64	7	-6	AP HI	PEN	4.0	3.7	3.0	2.0	1.3	0.3	0.1
AW	2.4				DC	4	3	3	2	1	1	1
	Drm											
					MA	0.2	0.3	0.4	0.5	0.7	1.2	1.6
KD	3				BA	49	41	33	26	22	12	7
SAB	1				TOF	0	1	2	3	4	8	12

Bizon SMG- A new submachine gun from Russia. The Bizon is based on the Kalashnikov frame and chambered for the new 9mm Makarov High Impulse (AP HI) ammunition. The helical feed magazine serves as the weapon's foregrip.

Send Comments

Page last modified: February 03, 2001

Calico 950

Pistol/Carbine

9 mm Parabellum

U.S.A. Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	14	1	-19	FMJ	PEN	2.8	2.6	2.3	1.8	1.4	0.4	0.1	
W	3.3/5.2	2	-12		DC	4	4	3	2	1	1	1	
		3	-10										
RT	8	4	-9	JHP	PEN	2.7	2.5	2.1	1.7	1.3	0.4	0.1	
ROF	*	5	-8		DC	6	5	5	4	3	1	1	
		6	-7										

Cap	50/100		AP	PEN	3.8	3.5	3.0	2.4	1.9	0.5	0.1
AW	1.6/3.2			DC	4	4	3	2	1	1	1
	Mag										
KD	4			BA	46	37	28	21	16	7	1
SAB	3			TOF	1	1	2	4	7	27	77

Calico 950 9mmP-This unique weapon is made of lightweight modern materials. The standard 50-round magazine sits above the gun, there is a longer 100-round available. The magazine ejects the rounds through the bottom of the gun and all features are ambidextrous.

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Page last modified: February 03, 2001

Calico 960A

Personal Defence Weapon

9mmP

USA

Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data Range in 2 yard Hexes								
		AC	ALM			10	20	40	70	100	200	300	400
L	21/31	1-20	/-21	FMJ	PEN	3.2	3	2.5	2	1.6	0.7	0.3	0.1
W	6.8/8.2	2-10	/-11		DC	4	4	3	3	2	1	1	1
		3	-8										
RT	8	4	-6	JHP	PEN	3.1	2.9	2.4	1.9	1.5	0.7	0.3	0.1
ROF	*6	5	-5		DC	6	6	5	4	3	1	1	1
		6	-4										

Cap	50/100	7	-3	AP	PEN	4.5	4.2	3.6	2.8	2.2	1.0	0.5	0.2
AW	1.6	8	-2		DC	4	4	3	3	3	1	1	1
	Mag	9	-1										
					MA	.3/.2	.6/.4	1/.8	2	4	7	11	15
KD	5				BA	46	37	28	21	16	7	2	-2
SAB	4				TOF	0	1	2	3	5	11	19	27

Calico 960A 9mmP- This unique weapon is made of lightweight modern materials. The standard 50-round magazine sits above the gun, there is a longer 100-round available. The magazine ejects the rounds through the bottom of the gun and all features are ambidextrous. This weapon is closely related to the pistol version except it has a longer barrel and fires full auto.

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Page last modified: February 03, 2001

CAR 40 .40 S&W

Personal Defence Weapon

.40 S&W

USA

Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	27	1	-22	FMJ	PEN	2.4	2.3	2	1.6	1.3	0.5	0.2	0.1
W	7.6	2	-11		DC	4	4	3	2	1	1	1	1
		3	-9										
RT	8	4	-7	JHP	PEN	2.3	2.2	1.9	1.5	1.3	0.5	0.2	0.1
ROF	*7	5	-5		DC	6	5	5	4	3	1	1	1
		6	-4										

Cap	30	7	-3	AP	PEN	3.2	3	2.6	2.1	1.7	0.7	0.3	0.1
AW	1.5	8	-2		DC	4	4	3	3	2	1	1	1
	Mag	9	-1										
					MA	0.3	0.5	1	2	3	5	8	11
KD	5				BA	46	37	28	21	16	7	1	-2
SAB	4				TOF	1	1	3	5	8	15	24	35

CAR40 .40 S&W- This is a version of the CAR16 chambered for the .40 S&W cartridge.

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Page last modified: February 03, 2001

Carl Gustaf Kulsprutepistol Modell 45 and Modell 45B "Swedish K"

Submachinegun

9mm Parabellum

Sweden

Data Provided by Eero Juhola

Physical Data		Aim Time		Ballistic Data Range in 2 yard Hexes									
		AC	ALM			10	20	40	70	100	200	300	400
L	20 / 32	1	-22	FMJ	PEN	2.3	2.1	1.8	1.4	1.1	0.5	0.2	0.1
W	7.6	2	-12		DC	3	3	3	3	2	1	1	1
		3	-9										
RT	8	4	-7	JHP	PEN	2.2	2.0	1.8	1.7	1.3	0.4	0.2	0.1
ROF	*5	5	-6		DC	5	4	4	3	2	1	1	1
		6	-5										
Cap	36/50	7	-4	AP	PEN	3.2	3.0	2.5	1.9	1.5	0.6	0.3	0.1

AW	1.7/2.2 Mag	8	-3	DC	3	3	2	2	1	1	1	1
				MA	0.3	0.5	1	2	3	7	10	13
KD	3			BA	45	36	27	20	15	6	0	-3
SAB	3			TOF	0	1	2	4	6	13	23	32

Carl Gustaf Kulsprutepistol Modell 45 and Modell 45B "Swedish K"- Thanks to Johan H. A. Okker (jor@algonet.se) and another source who wishes to remain anonymous, I was able to correct and improve the Swedish K stats a bit. I just knew there would be people familiar with the weapon on the list.

I copied many of Johan's comments into the notes about the gun. The ROF information was provided by the anonymous source who has apparently tried to hack this weapon :)

The Carl Gustaf is the standard submachine gun of the Swedish army. In addition to Sweden, this fine gun was also produced in Egypt (as the "Port Said"). It was used by the Egyptian army in the 1967 war with Israel and also by Indonesia and other countries, notably by the US Special Forces in Southeast Asia.

The Model 45 and Model 45B differ mainly in respect to design features which affect shooter safety. There is a special bayonet mount which will accept a standard, c. 16 in. (40 cm) long Mauser bayonet.

The gun is capable of automatic fire only. A special high-velocity round which has better body armor penetration capabilities, the Model 9/39B, exists for the Carl Gustaf. The 9/39B is a lead core, thick steel jacketed projectile. The jacket is coated with copper to counter the increased wear a steel jacket would inflict on the weapon. Use the AP stats for this round.

The 50-round clip was discarded in the 1960's. With some reworking the Model 45B will accept the 70-round drum magazine of the 37/39 Suomi SMG. The Model 45 can use the drum magazine without reworking.

When firing full automatic, the weapon is easy to control but, due to the very heavy reciever, moves rather much with every round. It is possible, though forbidden, to field convert the weapon's feed mechanisms so that ROF is increased to *7 or even *9 or *10, but these may adversely affect reliability and even controllability (the weapon may fail to stop firing !).

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Page last modified: February 03, 2001

FAMAE

Submachine Gun

9mmP

Chile

Data provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	16/26	1	-22	FMJ	PEN	2.6	2.4	2.0	1.6	1.3	0.3	0.1	
W	7.7	2	-12		DC	4	3	3	2	1	1	1	
		3	-9										
RT	8	4	-7	JHP	PEN	2.4	2.3	1.9	1.5	1.2	0.3	0.1	
ROF	**7	5	-6		DC	5	5	4	3	2	1	1	
		6	-5										

Cap	30	7	-4	AP HI	PEN	3.4	3.2	2.7	2.1	1.7	0.5	0.1
AW	1.2	8	-3		DC	3	3	3	2	1	1	1
	Mag											
					3RB	-6	-1	4	8	11	16	19
					MA	0.3	0.7	1	2	3	7	10
KD	3				BA	46	37	28	21	16	7	1
SAB	3				TOF	1	1	2	5	8	29	81

FAMAE 9mmP-This SMG is produced in Chile by FAMAE Fabrications Militares.

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Page last modified: February 03, 2001

FN P-90 PDW

Personal Defence Weapon

5.7 x 28 mm

Belgium

Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	16	1	-22	FMJ	PEN	5.3	5.1	4.8	4.2	3.8	2.4	1.6	1.0
W	7	2	-12		DC	3	3	3	3	2	1	1	1
		3	-9										
RT	10	4	-7	JHP	PEN	5.0	4.8	4.5	4.0	3.6	2.3	1.5	1.0
ROF	*6	5	-6		DC	5	5	4	4	4	2	1	1
		6	-5										

Cap	50	7	-4	AP	PEN	7.4	7.1	6.6	5.9	5.3	3.4	2.2	1.4
AW	1.5	8	-3		DC	3	3	3	2	2	1	1	1
	Mag	9	-1										
		10	0		MA	0.2	0.3	0.5	1	2	3	5	7
KD	2	11	1		BA	60	50	42	34	29	20	14	11
SAB	2				TOF	0	1	1	3	4	10	18	30

P90 5.7x28mm-Is a unusual SMG designed by FN Herstal in Belgium. The company designed a new round that is a cross between a rifle and pistol round. The weapon has been made to be used by noninfantry personnel. The weapon is made to be easy to use and features a clear magazine.

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Page last modified: February 03, 2001

HK MP 2000

Personal Defence Weapon

9mmP

Germany

Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	10/14	1	-21	FMJ	PEN	2.5	2.3	2	1.5	1.2	0.5	0.2	0.1
W	8.8	2	-11		DC	3	3	3	2	2	1	1	1
		3	-8										
RT	8	4	-7	JHP	PEN	2.4	2.2	1.9	1.5	1.1	0.5	0.2	0.1
ROF	**7	5	-5		DC	5	5	4	3	2	1	1	1
		6	-4										

Cap	30	7	-3	AP	PEN	3.6	3.3	2.8	2.2	1.7	0.7	0.3	0.1
AW	1	8	-2		DC	3	3	3	2	2	1	1	1
	Mag	9	-1										
					3RB	-7	-2	3	7	10	16	19	21
					MA	0.3	0.5	1	2	3	5	8	11
KD	4				BA	46	37	28	21	16	7	1	-2
SAB	3				TOF	0	1	2	4	6	13	21	31

H&K MP 2000 9mmP-This gun is intended to put all the features of the MP-5 series in a single package. The guns magazines are straight and not compatible with the rest of the series. A very unique feature of the MP 2000 is its silencing system. The MP 2000 silences ammunition by bleeding away some propellant gas. This prevents the bullet from reaching supersonic speed. The bleed holes can be closed by a switch and this allows the bullets to reach normal velocity (1 CA to work the switch). The weapon has a switch for locking the bolt closed to eliminate mechanical noise but this requires the operator to work the bolt by hand before each shot.

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Page last modified: February 03, 2001

Heckler & Koch MP5 .40 S&W

Personal Defence Weapon

.40 S&W

Germany

Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	19/27	1	-20	FMJ	PEN	2.5	2.4	2.1	1.7	1.3	0.5	0.2	
W	6.8	2	-10		DC	4	4	3	2	1	1	1	
		3	-8										
RT	8	4	-6	JHP	PEN	2.4	2.3	2.0	1.6	1.3	0.5	0.2	
ROF	*7	5	-5		DC	6	5	5	4	3	1	1	
		6	-4										

Cap	30	7	-3	AP	PEN	3.3	3.1	2.7	2.2	1.8	0.6	0.2
AW	1.5	8	-2		DC	4	4	3	3	2	1	1
	Mag	9	-1									
					MA	0.5	0.8	1	3	5	8	12
KD	5				BA	46	37	28	21	16	7	1
SAB	4				TOF	1	1	3	5	8	15	24

H&K MP-5 .40 S&W-Is just one version of the MP-5 series chambered for the .40 S&W cartridge

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Page last modified: February 03, 2001

Heckler & Koch MP5 10mm

Personal Defence Weapon

10mm

Germany

Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	19/27	1	-20	FMJ	PEN	3.4	3.1	2.7	2.2	1.8	0.6	0.2	0.1
W	6.9	2	-10		DC	5	5	4	4	3	1	1	1
		3	-8										
RT	8	4	-6	JHP	PEN	3.2	3.0	2.6	2.1	1.7	0.6	0.2	0.1
ROF	*7	5	-5		DC	7	7	6	5	4	1	1	1
		6	-4										

Cap	30	7	-3	AP	PEN	4.5	4.2	3.6	2.9	2.4	0.8	0.3	0.1
AW	1.5	8	-2		DC	5	5	4	4	3	1	1	1
	Mag	9	-1										
					MA	0.6	1	2	4	6	12	19	25
KD	5				BA	48	40	32	25	20	11	5	2
SAB	4				TOF	0	1	2	4	7	23	59	132

H&K MP-5 10mm-Is another version of the MP-5 chambered for the 10mm round..

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Page last modified: February 03, 2001

HK MP5 SD3

Personal Defence Weapon

9mmP

Germany

Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	24/31	1	-22	FMJ	PEN	1.7	1.6	1.4	1.1	0.8	0.2	0.1	
W	8.7	2	-12		DC	2	2	1	1	1	1	1	
		3	-9										
RT	8	4	-7	JHP	PEN	1.6	1.5	1.3	1.0	0.8	0.2	0.1	
ROF	*7	5	-6		DC	4	3	3	1	1	1	1	
		6	-5										

Cap	30	7	-4	AP	PEN	2.3	2.1	1.8	1.4	1.1	0.3	0.1
AW	1.2	8	-3		DC	2	2	1	1	1	1	1
	Mag											
					MA	0.3	0.5	1	2	3	5	8
KD	3				BA	46	37	28	21	16	7	1
SAB	2				TOF	1	1	3	6	9	35	99

MP5SD3 9mmP-This is a silenced version of the MP5 SMG. The weapon can use normal 9mmP rounds, it uses small holes to reduce the bullet velocity. For minimum noise 9mmP subsonic is recommended for use. The version here has a muzzle velocity of 284m/s, which is the actual muzzle velocity of real weapon. The suppresser requires no maintenance and will last indefinitely. This same data can be used for the MP2000 in suppression mode.

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Page last modified: February 03, 2001

IDW 10mm

Personal Defence Weapon

10mm

Great Britain

Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	11	1	-21	FMJ	PEN	2.2	2.1	1.8	1.5	1.2	0.4	0.1	
W	7.3	2	-11		DC	4	3	3	2	1	1	1	
		3	-9										
RT	8	4	-7	JHP	PEN	2.1	2.0	1.7	1.4	1.1	0.4	0.1	
ROF	*4	5	-6		DC	5	5	4	3	2	1	1	
		6	-5										

Cap	32	7	-4	AP	PEN	3	2.8	2.4	1.9	1.6	0.6	0.2
AW	1.4				DC	4	3	3	2	1	1	1
	Mag											
					MA	0.2	0.2	0.3	0.4	0.9	1	2
KD	4				BA	48	40	32	25	20	11	5
SAB	3				TOF	1	1	3	5	8	28	72

IDW 10mm-The IDW is a compact SMG designed and built by Bushman Ltd. in UK. the Bushman is extremely heavy due to the use of machined steel for the gun. The Bushman has a small catch controlled by a microchip that reduces the rate of fire to 450rpm. The gun designer reasoned that SMGs would have a natural frequency were they would fire smoothly at. The IDW is controllable in even full-auto mode one-handed, the gun doesn't jump it merely rocks slightly in the hand. I am not sure how hard it is for a user to adjust the ROF for the gun. The natural rate of fire if the catch was disabled would be 1400 rpm, this would certainly prevent the gun from being fired one-handed and make the gun very uncontrollable.

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Page last modified: February 03, 2001

Micro - UZI

Personal Defence Weapon

9mmP

Israel

Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	10/18	1	-20	FMJ	PEN	1.9	1.8	1.5	1.1	0.9	0.4	0.1	0.1
W	5	2	-12		DC	3	3	2	2	1	1	1	1
		3	-10										
RT	7	4	-9	JHP	PEN	1.9	1.7	1.4	1.1	0.8	0.3	0.1	0.1
ROF	*10	5	-8		DC	4	4	3	2	2	1	1	1
		6	-7										

Cap	20	7	-7	AP	PEN	2.7	2.5	2.1	1.6	1.2	0.5	0.2	0.1
AW	0.9	8	-6		DC	3	3	2	2	1	1	1	1
	Mag												
					MA	0.5	1	2	3	5	10	14	19
KD	3				BA	45	37	28	21	16	6	1	-2
SAB	3				TOF	1	1	2	4	6	15	25	36

Micro-UZI 9mmP-This is the smallest and lightest member of the UZI Family. The bolt has a tungsten core to increase its weight and keep the rate of fire somewhat manageable.

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Page last modified: February 03, 2001

Sterling L2A3

Personal Defence Weapon

9mmP

Great Britain

Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	19/28	1	-20	FMJ	PEN	2.5	2.3	2	1.5	1.2	0.5	0.2	0.1
W	6.8	2	-10		DC	3	3	3	2	2	1	1	1
		3	-8										
RT	8	4	-6	JHP	PEN	2.4	2.2	1.9	1.5	1.1	0.5	0.2	0.1
ROF	*5	5	-5		DC	5	5	4	3	2	1	1	1
		6	-4										

Cap	34	7	-3	AP	PEN	3.6	3.3	2.8	2.2	1.7	0.7	0.3	0.1
AW	1.3	8	-2		DC	3	3	3	2	2	1	1	1
	Mag	9	-1										
					MA	0.2	0.4	0.9	1	2	4	6	9
KD	4				BA	46	37	28	21	16	7	1	-2
SAB	3				TOF	0	1	2	4	6	13	21	31

Sterling L2A3-The full size Sterling SMG.

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Page last modified: February 03, 2001

Sterling L34A1

Personal Defence Weapon

9mmP

Great Britain

Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	26/34	1	-23	FMJ	PEN	2	1.9	1.6	1.3	1	0.3	0.1	
W	9.7	2	-21		DC	3	3	2	1	1	1	1	
		3	-9										
RT	8	4	-8	JHP	PEN	1.9	1.8	1.5	1.2	0.9	0.3	0.1	
ROF	*5	5	-6		DC	4	4	3	2	1	1	1	
		6	-5										

Cap	34	7	-4	AP	PEN	2.7	2.5	2.1	1.7	1.3	0.4	0.1
AW	1.2	8	-3		DC	3	3	2	1	1	1	1
	Mag	9	-2									
					MA	0.2	0.4	0.9	1	2	4	6
KD	3				BA	46	37	28	21	16	7	1
SAB	3				TOF	1	1	3	6	9	35	99

Sterling L-34A1 9mmP-This is the silenced version of the Sterling L2A3 SMG. The weapon can use normal 9mmP rounds, it uses small holes to reduce the bullet velocity. For minimum noise 9mmP subsonic is recommended for use. The version here has a muzzle velocity of 308m/s, which is the actual muzzle velocity of real weapon. The suppresser requires no maintenance and will last indefinitely.

Send Comments

Page last modified: February 03, 2001

AUG 9mm

Personal Defence Weapon

9mmP

Austria

Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	27	1	-22	FMJ	PEN	3.2	3	2.5	2	1.6	0.7	0.3	0.1
W	8	2	-11		DC	4	4	3	3	2	1	1	1
		3	-9										
RT	8	4	-7	JHP	PEN	3.1	2.9	2.4	1.9	1.5	0.7	0.3	0.1
ROF	*6	5	-5		DC	6	6	5	4	3	1	1	1
		6	-4										

Cap	32	7	-3	AP	PEN	4.5	4.2	3.6	2.8	2.2	1.0	0.5	0.2
AW	1.3	8	-2		DC	4	4	3	3	2	1	1	1
	Mag	9	-1										
					MA	0.2	0.4	0.9	1	2	4	6	9
KD	4				BA	46	38	29	21	16	7	2	-2
SAB	3				TOF	0	1	2	3	5	11	19	27

AUG 9mmP-This is a 9mmP weapon based on Steyr AUG. Many components are the same. In fact the SMG can be ordered as a conversion kit from the rifle.

Send Comments

Page last modified: February 03, 2001

Steyr TMP 9mmP

Tactical Machine Pistol

9 mm Parabellum

Austria

Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	11	1	-19	FMJ	PEN	2.1	1.9	1.6	1.3	1.0	0.3	0.1	
W	3.5	2	-11		DC	3	3	2	1	1	1	1	
		3	-8										
RT	8	4	-7	JHP	PEN	2.0	1.9	1.6	1.2	1.0	0.3	0.1	
ROF	*5	5	-6		DC	4	4	4	2	1	1	1	
		6	-5										

Cap	25	7	-4	AP	PEN	2.8	2.6	2.2	1.7	1.4	1.0	0.1
AW	0.8				DC	3	3	2	1	1	1	1
	Mag											
					MA	0.3	0.5	1	2	3	5	8
KD	3				BA	46	37	28	21	16	6	1
SAB	3				TOF	1	1	3	5	8	32	90

TMP 9mmP-This is a weapon made by Steyr called the TMP (Tactical Machine Pistol) chambered for 9mmP. The TMP uses about half the parts of a normal SMG making it very reliable. As with all Steyr automatic weapons, the TMP has a two stage trigger that allows the user to fire single shots in full-auto mode.

Send Comments

Page last modified: February 03, 2001

TEC-9

Personal Defence Weapon

9mmP

USA

Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	11	1	-19	FMJ	PEN	2.3	2.1	1.8	1.4	1.1	0.5	0.2	0.1
W	3.8	2	-11		DC	3	3	3	2	1	1	1	1
		3	-8										
RT	8	4	-7	JHP	PEN	2.2	2.0	1.7	1.3	1.0	0.4	0.2	0.1
ROF	*7	5	-6		DC	5	4	4	3	2	1	1	1
		6	-5										

Cap	32	7	-4	AP	PEN	3.2	3	2.5	1.9	1.5	0.6	0.3	0.1
AW	1.3				DC	3	3	2	2	1	1	1	1
	Mag												
					MA	0.4	0.8	2	3	4	8	12	15
KD	3				BA	46	37	28	21	16	7	1	-2
SAB	3				TOF	0	1	2	4	6	13	23	32

TEC 9mmP-The infamous TEC-9 manufactured by Intratec US. This inexpensive gun can be easily converted to full-auto by criminals, which has allowed the gun to acquire a notorious reputation in the US.

Send Comments

Page last modified: February 03, 2001

Delisle Mk 3

Rifle

.45 ACP

Great Britain

Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	38	1	-21	FMJ	PEN	1.5	1.4	1.2	0.9	0.7	0.3		
W	8.4	2	-10		DC	4	4	3	2	1	1		
		3	-6										
RT	10	4	-4										
ROF	3	5	-3										
		6	-2										

Cap	4	7	0								
AW	0.6	8	1								
	Mag	9	1								
		10	3								
KD	4	11	5		BA	45	36	27	20	15	5
SAB	2				TOF	1	2	3	5	8	19

Delisle Mark 3 .45-Is a silent weapon used during WWII. The weapon is very quiet only producing the sound of firing pin striking the primer. I recommend to use a sound magnitude of 55. The weapon has a built in box to collect shell casings. The gun comes standard with a bipod and scope.

Send Comments

Page last modified: January 03, 2002

Galil AR 5.56

Assault Rifle

5.56 NATO

Israel

Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	39	1	-22	FMJ	PEN	16	15	14	12	11.0	6.8	4.3	2.7
W	11	2	-12		DC	6	6	6	6	5	4	3	2
		3	-7										
RT	8	4	-5	JHP	PEN	15.0	15.0	13.0	12.0	10.0	6.5	4.1	2.6
ROF	*5	5	-4		DC	8	8	8	7	7	6	5	3
		6	-3										

Cap	35	7	-1	AP	PEN	22	21	20	17	15	9.5	6.1	3.9
AW	1.6	8	0		DC	6	6	6	5	5	4	3	2
	Mag	9	1										
		10	2		MA	0.2	0.5	0.9	2	2	5	7	9
KD	4	11	3		BA	64	55	45	38	33	24	19	14
SAB	3				TOF	0	0	1	1	2	5	7	11

Galil AR 5.56mm Nato-Is a modified Galil rifle that has a scope and bipod attached to it.

Send Comments

Page last modified: January 03, 2002

HK G-36

Assault Rifle

5.56mm NATO

Germany

Data Provided by R.J. Andron

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	29/39	1	-23	FMJ	PEN	16	15	14	12	10	6	4	2
W	8.5	2	-12		DC	6	6	6	6	5	4	3	2
		3	-8										
RT	8	4	-6	JHP	PEN	15	14	13	11	10	6	4	2
ROF	*6	5	-5		DC	8	8	8	7	7	6	5	3
		6	-4										

Cap	30	7	-3	AP	PEN	23	22	20	17	15	9	5	3
AW	1 .0	8	-2		DC	6	6	6	6	5	4	3	2
	Mag	9	-1										
		10	0		MA	0.4	0.8	1.6	2.8	4	8	12	16
KD	4	11	1		BA	60	51	42	35	30	20	15	11
SAB	3				TOF	0	1	1	2	2	5	8	11

HK G-36- The G-36 was adopted by the German Army following the collapse of the G-11 project. The G-36 was designed as a cost-effective rifle able to fire the 5.56mm NATO ammunition required to conform to NATO standard. The weapon uses a gas-operated rotating bolt and incorporates an integral 3x optical sight and a red-dot collimating sight. The export version, the G-36E, is identical, but eliminates the red-dot sight and replaces the optical sight with a 1.5x version.

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Page last modified: February 03, 2001

HK G-36K

Assault Rifle

5.56mm NATO

Germany

Data Provided by R.J. Andron

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	24/34	1	-23	FMJ	PEN	16	15	14	12	10	6	4	2
W	7.9	2	-12		DC	6	6	6	6	5	4	3	2
		3	-8										
RT	8	4	-6	JHP	PEN	15	14	13	11	10	6	4	2
ROF	*6	5	-5		DC	8	8	8	7	7	6	5	3
		6	-4										

Cap	30	7	-3	AP	PEN	23	22	20	17	15	9	5	3
AW	1.0	8	-2		DC	6	6	6	6	5	4	3	2
	Mag	9	-1										
		10	0		MA	0.4	0.8	1.6	2.8	4	8	12	16
KD	4	11	1		BA	60	51	42	35	30	20	15	11
SAB	3				TOF	0	1	1	2	2	5	8	11

HK G-36K- Short-barreled version of the G-36. Issued primarily to German Special Operations units.

Send Comments

Page last modified: February 03, 2001

MSG-90

Sniper Rifle

7.62 NATO

Germany

Data Provided by R.J. Andron

Physical Data		Aim Time		Ballistic Data Range in 2 yard Hexes								
		AC	ALM			10	20	40	70	100	200	300	400
L	46	1	-26	FMJ	PEN	20	19	18	16	15	11	8	6
W	15.2	2	-16		DC	8	8	8	7	7	7	6	5
		3	-8										
RT	8	4	-6	JHP	PEN	19	18	17	16	14	10	7	5
ROF	*	5	-4		DC	9	9	9	9	9	8	8	7
		6	-3										
Cap	20	7	-2	AP	PEN	29	28	25	23	21	15	11	8

AW	1	8	-1	DC	8	8	7	7	7	6	6	5
	Mag	9	0									
		10	1	MA	0.4	0.8	1.6	2.8	4	8	12	16
KD	9	11	2	BA	61	53	45	37	32	23	17	13
SAB	5	12	4	TOF	0	1	1	2	3	5	8	12

HK MSG-90- German sniper rifle introduced in 1987. The MSG-90 uses a roller-locked delayed blowback breech and is typically fitted with a 10x optical sight. The MSG3 is identical, but adds iron sights.

Send Comments

Page last modified: February 09, 2001

HK PSG1

Sniper Rifle

7.62mm NATO

Germany

Data provided by Matthew A. Crump

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	47	1	-24	FMJ	PEN	20	19	18	16	15	11	7.6	5.5
W	16.8	2	-14		DC	8	8	8	7	7	7	6	5
		3	-7										
RT	8	4	-5	JHP	PEN	19	18	17	16	14	10	7.3	5.3
ROF	*	5	-4		DC	9	9	9	9	9	8	8	7
		6	-2										

Cap	20	7	0	AP	PEN	28	27	25	23	21	15	11	7.7
AW	1.4	8	1		DC	8	8	7	7	7	6	6	5
	Mag	9	2										
		10	3										
KD	10	12	4		BA	68	59	50	43	38	28	22	18
SAB	5				TOF	0	0	1	2	2	5	8	11

Heckler & Koch PSG-1- Semi-automatic sniper rifle based on the HK G3. This weapon can use 20 round or 5 round magazines. Data for this weapon is with 20 round mag..

Send Comments

Page last modified: February 03, 2001

M21

Sniper Rifle

7.62mm NATO

USA

Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	44	1	-23	FMJ	PEN	20	19	18	16	15	11	7.6	5.6
W	12	2	-13		DC	8	8	8	7	7	7	6	5
		3	-8										
RT	8	4	-6	JHP	PEN	19	18	17	16	14	10	7.3	5.3
ROF	*	5	-4		DC	9	9	9	9	9	8	8	7
		6	-2										

Cap	20	7	-1	AP	PEN	28	27	25	23	21	15	11	7.7
AW	1.5	8	0		DC	8	8	7	7	7	6	6	5
	Mag	9	1										
		10	3										
KD	10	11	4		BA	68	59	50	43	38	28	22	18
SAB	5				TOF	0	0	1	2	2	5	8	11

M21-This is the army's current sniper rifle pending deployment of the M24. This basically a M14 constructed to higher tolerances. This results in a rugged accurate rifle. This version listed is semi-auto only. The gun comes standard with a bipod and scope.

Send Comments

Page last modified: February 03, 2001

Model 85 Parker Hale

Sniper Rifle

7.62 NATO

Great Britain

Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data Range in 2 yard Hexes								
		AC	ALM			10	20	40	70	100	200	300	400
L	48	1	-25	FMJ	PEN	20	19	18	16	15	11	7.7	5.5
W	14	2	-15		DC	8	8	8	7	7	7	6	5
		3	-8										
RT	8	4	-6	JHP	PEN	19	18	17	16	14	10	7.4	5.3
ROF	3	5	-4		DC	9	9	9	9	9	8	8	7
		6	-3										
Cap	10	7	-2	AP	PEN	28	27	25	23	21	15	11	7.8

AW	1.1	8	0		DC	8	8	7	7	7	6	6	5
	Mag	9	1										
		10	2										
KD	10	11	4		BA	68	59	50	43	38	28	22	18
SAB	5				TOF	0	0	1	2	2	5	8	11

Model 85 7.62mm NATO-Is a rugged sniper rifle in British Service used by the British Army. The weapon was originally made by Parker-Hale but the design was sold to Navy Arms in the U.S.. The gun comes standard with a scope.

Send Comments

Page last modified: February 09, 2001

VG 1-5 (Volkssturm-Gewehr 1-5 or Versuchs-Gerat 1-5)

Carbine

7.92mm Kurz

Germany

Data provided by R.J. Andron

Physical Data		Aim Time				Ballistic Data Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	34	1	-24	FMJ	PEN	9.2	8.8	8.1	7.1	6.3	4.1	2.7	1.7
W	10	2	-14		DC	6	6	6	6	6	4	3	2
		3	-9										
RT	9	4	-8	JHP*	PEN	8.6	8.3	7.7	6.8	6.0	4.0	2.6	1.7
ROF	*	5	-6		DC	8	8	8	7	7	6	4	2
		6	-5										
Cap	30	7	-4	AP	PEN	13	13	12	10	9.0	5.9	3.9	2.6

AW	2.1	8	-3	DC	6	6	6	6	5	4	2	2
	Mag	9	-2									
KD	6			BA	58	49	40	32	27	17	12	8
SAB	4			TOF	0	1	1	2	3	7	11	16

VG 1-5 (Volkssturm-Gewehr 1-5 or Versuchs-Gerat 1-5)- The VGI-5 is an unusual and rare firearm that only saw use in the late stages of WWII as part of the Volksturm series of weapons, and was used on the Eastern front as German Armies and Home Guard fought to defend their homeland from the onslaught of the Red Army.

Externally, the weapon appears nearly identical to the MP 35, but is much cruder in construction. The VGI-5 was made as a delayed blowback-operated semi-automatic carbine firing the 7.92mm Kurz (short) round. Cheap, easy to operate, and easy to manufacture, the VGI-5 played a near-forgotten part in WWII.

The rifle was quickly developed by Chief Designer Herr Barnitzke of Gusloft-Werke as part of the Primitiv-Waffen-Programm of 1944 and was used by the Home Guard (Volksturn) and possibly by the postwar Werewolf Nazi guerrilla movement. Only small production occurred from January 1945.

Send Comments

Page last modified: February 03, 2001

Vektor CR21

Assault Rifle

5.56mm NATO

South Africa

Data Provided by R.J. Andron

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	30	1	-23	FMJ	PEN	15	14	13	11	10	6.2	3.9	2.5
W	9.7	2	-12		DC	6	6	6	5	5	4	3	2
		3	-8										
RT	8	4	-6	JHP	PEN	14	13	12	11	9.3	5.9	3.8	2.4
ROF	*6	5	-5		DC	8	7	7	7	7	6	5	4
		6	-4										

Cap	30	7	-3	AP	PEN	20	20	18	16	14	8.7	5.6	3.6
AW	1.1	8	-2		DC	6	6	5	5	4	3	3	2
	Mag	9	-1										
		10	0		MA	0.2	0.5	1	2	2	5	7	10
KD	4	11	1		BA	60	51	42	35	30	20	15	11
SAB	3				TOF	0	1	1	2	2	5	8	11

Vektor CR21 - The Vektor CR 21 (Combat Rifle -- 21st Century) is developed by the South African firm of Vektor. It is being marketed as an upgrade to Kalashnikov-type actions, including the Galils and R4s. The bullpup-configuration CR21 uses a polymer-injection molded stock and cover, and a tritium-illuminated fibre-optic 1x reflex sight.

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Page last modified: February 11, 2001

Winchester M1895 Russian

Rifle

7.62 x 53 mm (7,62 kiv/Winchester)

USA Data Provided by Eero Juhola

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	46.5	1	-23	m/08	PEN	20	19	17	15	13	7.6	4.6	2.8
W	9.5	2	-12		DC	8	8	8	8	8	7	7	6
		3	-9										
RT	7	4	-7	m/30	PEN	24	22	20	17	15	9	5.4	3.3
ROF	2	5	-6		DC	8	8	8	8	8	7	7	6
		6	-5										

Cap	5	7	-4	*JHP	PEN	18	18	16	14	12	7.2	4.4	2.7
AW	0.3	8	-3		DC	10	9	9	9	9	9	8	8
	cs	9	-2										
		10	-1	*AP	PEN	29	27	24	21	18	11	6.6	4.0
KD	12	11	0		DC	8	8	8	8	7	7	7	6
SAB	7												
					BA	64	56	48	41	36	27	21	17
					TOF	0	0	1	2	2	5	8	11

Winchester m/1895 Russian - Between 1915 and 1917 the Winchester Repeating Arms Company supplied Imperial Russia with some 300 000 Winchester rifles model 1895,

i.e. the Winchester M95 Russian. Designed by John Browning, the gun fired the standard model 1908 7.62x53mm cartridge and had a magazine of four, with the fifth going into the barrel. Unlike earlier Winchesters, the m/1895 dispensed with the tubular magazine and used a regular box magazine loaded, in the Russian model at least, with a charging strip. Data is given for both original m/1908 and m/1930 heavy ball ammunition.

The rifle's sights were graduated in arshins, an old Russian measurement corresponding to 71 cm (28 inches). The rifle could be fitted with a 52 cm (20 in) bayonet. Compared to a bolt action the rifle was probably more difficult to operate from a prone firing position but had an advantage if fired in any upright position in that the operator did not have to lift his head off the sights to cycle the action. The m/1895 has a sustained rate of fire of 56 rounds per minute.

The m/1895 is the strongest lever-action rifle ever made. For other markets, Winchester produced the rifle in 30-40 Krag, 30-03, 30-06, 303 British, 35 Winchester, 405 Winchester, 38-72, and 40-72 blackpowder calibers. The barrel lengths varied from the Rifle, with barrels from 22 to 28 inches long, to the Carbine, 22 inches, and the Musket (originally intended

for Army sales) 24 to 30 inches. A total of 425 000 were made between 1895 and the early 1930s. The m/1895 was

the Wimbledon Cup 1896 winner for the 1000 yard championship. Today, Browning offers a replica of the 1895 in .30-06 for about 1100 dollars.

Imperial Russian troops in Finland used the Winchester rifle among other types and both sides employed it in the Civil War of 1918. Due to its fine workmanship the rifle was highly valued but its small numbers and unusual mechanism relegated the type to reserve use only. Fewer than 4000 Winchesters survived the Civil War.

When the Winter War begun the Finns actually de-mothballed even these venerable weapons, though they were primarily distributed to artillery units and troops on the home front. The remaining 500 rifles were sold to civililians in the Fifties.

Some notes kindly provided by John T. Kwon

Send Comments

Page last modified: February 09, 2001

Baby Eagle

Baby Eagle

Pistol

9mmP

Israel

Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	8	1	-17	FMJ	PEN	2.1	1.9	1.6	1.3	1.0	0.3	0.1	
W	2.9	2	-11		DC	3	3	2	1	1	1	1	
		3	-10										
RT	4	4	-9	JHP	PEN	2.0	1.8	1.6	1.2	1.0	0.3	0.1	
ROF	*	5	-8		DC	4	4	3	2	1	1	1	
		6	-7										

Cap	16		AP	PEN	2.8	2.6	2.2	1.7	1.4	0.4	0.2
AW	0.6			DC	3	3	2	2	1	1	1
	Mag										
KD	3			BA	46	37	28	21	16	7	1
SAB	3			TOF	1	1	3	5	8	13	22

Baby Eagle 9mmP-This weapon is a large rugged double-action pistol. Unlike the bigger Desert Eagle it is recoil operated instead of gas. The gun also comes in .40S&W and there is a special conversion kit to convert the 9mmP to .41in AE. The weapon is produced by IMI and is also produced under license in the U.S. by Magnum Research.

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Page last modified: February 03, 2001

Colt Delta Elite 10 mm

Pistol

10 mm

U.S.A. Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data Range in 2 yard Hexes								
		AC	ALM			10	20	40	70	100	200	300	400
L	9	1	-17	FMJ	PEN	2.6	2.4	2.1	1.7	1.4	0.5	0.2	0.1
W	2.7	2	-11		DC	4	4	3	2	1	1	1	1
		3	-10										
RT	4	4	-9	JHP	PEN	2.4	2.3	2.0	1.6	1.3	0.5	0.2	0.1
ROF	*	5	-8		DC	6	5	5	4	3	1	1	1
		6	-7										
Cap	7			AP	PEN	3.4	3.2	2.8	2.2	1.8	0.6	0.2	0.1

AW	0.3 Mag		DC	4	4	3	2	1	1	1	1
KD	5		BA	48	40	32	25	20	11	5	2
SAB	4		TOF	1	1	3	5	8	27	67	151

Delta Elite 10mm-Is a 10mm single-action autoloader based closely on the design of the M1911. The gun data is for a normal load.

Send Comments

Page last modified: February 03, 2001

Desert Eagle .50 AE

Pistol

.50 Calibre Action Express

Israel

Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	10	1	-19	FMJ	PEN	4.6	4.2	3.5	2.6	1.9	0.2		
W	4.6	2	-12		DC	8	8	8	7	5	1		
		3	-10										
RT	4	4	-9	JHP	PEN	4.4	4.0	3.3	2.5	1.8	0.2		
ROF	*	5	-8		DC	9	9	9	8	7	1		
		6	-7										

Cap	8	7	-6	AP	PEN	6.0	5.5	4.5	3.3	2.5	0.3
AW	0.6				DC	8	8	8	7	5	1
	Mag										
KD	9				BA	53	44	35	28	23	16
SAB	7				TOF	0	1	2	3	7	38

Desert Eagle .50in AE- This is a large autoloader that is chambered for the .50in AE round based on the rugged Desert Eagle frame. This round because of its slower speed packs less energy (2400J) than the Casull at 2800J.

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Page last modified: February 03, 2001

7.65mm DWM Luger 08/20

Automatic Pistol

7.65mm Parabellum

Germany

Data Provided by Eero Juhola

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	8.75	1	-16	FMJ	PEN	1.9	1.8	1.6	1.4	1.2	0.7	0.4	0.3
W	1.9	2	-11		DC	3	3	2	2	1	1	1	1
		3	-10										
RT	4	4	-9	*JHP	PEN	1.8	1.7	1.5	1.3	1.1	0.7	0.4	0.2
ROF	*	5	-8		DC	4	3	3	2	1	1	1	1
		6	-7										

Cap	8		*AP	PEN	2.7	2.5	2.3	2.0	1.7	1.0	0.6	0.4
AW	0.2 box			DC	3	2	2	2	1	1	1	1
KD	2			BA	46	38	29	22	17	8	3	-1
SAB	3			TOF	0	1	2	3	5	12	20	29

7.65 mm DWM Luger 08/20 - This is the 7.65mm version of the excellent 9mm Parabellum P08 (model 1908) automatic pistol, commonly called the Luger, which was used by the German army in World War I. The Versailles peace treaty specified that German pistols had to be of a caliber smaller than 9mm and that their barrels could not be longer than 102 mm. Thus a modified version of the pistol was introduced, using the powerful 7.65mm Parabellum cartridge.

The gun achieved considerable export success in the Twenties and Thirties. Finland purchased 8000 such weapons (designated as the Parabellum m/23) and during the Winter War they were used by officers, NCOs, heavy weapon, tank and aircraft crews.

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Page last modified: February 09, 2001

9mm DWM Luger P-08

Automatic Pistol

9mm Parabellum

Germany

Data Provided by Eero Juhola

Physical Data		Aim Time				Ballistic Data Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	8.75	1	-16	FMJ	PEN	2.0	1.8	1.7	1.4	1.2	0.7	0.4	0.3
W	1.9	2	-11		DC	3	3	2	2	1	1	1	1
		3	-10										
RT	4	4	-9	*JHP	PEN	1.9	1.8	1.6	1.4	1.2	0.7	0.4	0.3
ROF	*	5	-8		DC	4	4	3	2	1	1	1	1
		6	-7										
Cap	4			*AP	PEN	2.9	2.7	2.4	2.1	1.8	1.1	1	0.4

AW	0.2 box		DC	3	2	2	2	1	1	1	1
KD	2		BA	45	36	27	20	15	5	0	-3
SAB	4		TOF	1	1	2	4	6	15	25	36

9mm DWM Luger P-08 - This is the original 9mm Parabellum P08 (model 1908) automatic pistol, commonly called the Luger, which was used by the German army in both World Wars. The weapon achieved an enviable reputation for reliability and stopping power and was widely exported to other countries. The gun continued to be manufactured until 1943. Some 200 pistols of this type found their way to Finland. They were used in the Continuation War by officers, NCOs, heavy weapon, tank and aircraft crews.

Some notes kindly provided by Gurth.

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Page last modified: February 09, 2001

9mm DWM Luger 17, Luger Artillery Model 17

Automatic Pistol

9mm Parabellum

Germany

Data Provided by Eero Juhola

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	12.75	1	-17	FMJ	PEN	2.3	2.1	1.9	1.7	1.4	0.9	0.5	0.3
W	2.3	2	-11		DC	3	3	3	2	1	1	1	1
		3	-10										
RT	4	4	-9	*JHP	PEN	2.2	2.0	1.8	1.6	1.4	0.8	0.5	0.3

ROF	*	5	-8		DC	5	4	4	3	2	1	1		1
		6	-7											
Cap	8			*AP	PEN	3.3	3.1	2.8	2.4	2.1	1.3	1	0.5	
AW	0.2				DC	3	3	2	2	1	1	1	1	
	box													
KD	3				BA		45	36	27	20	15	5	0	-3
SAB	4				TOF		1	1	2	4	6	15	25	36

9 mm Luger Artillery m/17 Automatic Pistol - This is my second version of the 9mm Luger "cannon" pistol. If anyone has additions or comments, please let me know.

This is the long-barreled version of the 9mm Parabellum P08 automatic pistol. The original pistol proved very useful in trench warfare. The artillery model was introduced in 1917 and was first issued to artillery forward observers and machine gun crews but later also NCOs received them. At a time when submachine guns were just coming into use a fast auto-loading pistol was much handier in close quarters engagements than a conventional bolt action rifle.

The artillery model had adjustable sights for distances up to 800 meters and was usually fitted with the same eight-round box magazine as the model 1908. However a 32-round "snail" magazine was also available though it was prone to jamming, a tendency which was largely cured when the factory came up with a rounded-nose version of the originally pointed Parabellum bullet. The 32-round magazine also fits the Bergmann MP 18/I submachinegun and the Parabellum m/08 pistol.

The pistol could also be fitted with a 35-centimeter long, wooden shoulder-stock which had straps so that it could be attached to one's belt for carrying

purposes. Unlike the Mauser's, the Luger's stock could not be used as holster for the weapon.

Some notes kindly provided by Gurth.

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Page last modified: February 09, 2001

7.65mm Gabilondo Ruby

Automatic Pistol

7.65mm Browning

Spain Data Provided by Eero Juhola

Physical Data		Aim Time				Ballistic Data Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	6.3	1	-16	FMJ	PEN	0.8	0.7	0.7	0.6	0.5	0.1		
W	2	2	-11		DC	1	1	1	1	1	1		
		3	-10										
RT	4	4	-9	*JHP	PEN	0.7	0.7	0.6	0.5	0.5	0.1		
ROF	*	5	-8		DC	2	2	1	1	1	1		
Cap	9			*AP	PEN	1.1	1.1	1.0	0.8	0.7	0.4		

AW	0.2 box		DC	1	1	1	1	1	1	
KD	2		BA	40	31	23	16	12	3	
SAB	3		TOF	1	1	3	5	8	19	

7.65 mm Gabilondo Ruby Automatic Pistol

- **Pistola Automatica "Ruby" 7.65 mm**
- **7.65 mm Gabilondo Ruby Automatic Pistol**
- **7,65 pist/19, pistooli m/espanjalainen**

The 7.65 mm Browning was a very popular caliber in the beginning of the century but successful pistols using it are few and far between. While sufficient for law enforcement purposes, the Browning round was unsuitable for military use because of its limited stopping power and accuracy.

Based on the Browning type automatic pistol, the Ruby is a short-barreled, unremarkable weapon. During the First World War literally scores of small Spanish factories produced it, the main customers being France and Italy, both of which had an urgent need for pistols. Despite its low quality the wartime demand for the 7.65 mm Ruby pistol was such that it was kept in production until 1919. That same year the French War Ministry was all too glad to sell Finland 10,000 pistols, which were designated the m/19.

The Ruby proved to be totally unsuited for serious use. Pistols made by different factories had non-interchangeable parts. Materials and workmanship were substandard and ten years later twenty percent of the pistols were no longer serviceable. In addition the pistol was heavy for its size, inaccurate, unreliable and lacked stopping power. A combination of the worst features associated with automatic pistols, the Ruby is considered by some experts to be completely worthless as a means of personal protection.

Despite these deficiencies the Finnish Army was forced to use the Ruby pistol in both the Winter War and the Continuation War, though the type was mostly relegated to supply echelon and home front personnel. The remaining pistols were sold to collectors and Army personnel in the Sixties and Seventies. The type was finally retired in 1986.

7.65mm Gallibondo Ruby

Send Comments

Page last modified: February 09, 2001

Glock 18

Submachine Pistol

9mmP

U.S.A. Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	8	1	-17	FMJ	PEN	2.1	1.9	1.6	1.3	1.0	0.3	0.1	
W	2	2	-11		DC	3	3	2	1	1	1	1	
		3	-10										
RT	4	4	-9	JHP	PEN	2.0	1.8	1.6	1.2	1.0	0.3	0.1	
ROF	*12	5	-8		DC	4	4	3	2	1	1	1	
		6	-7										
Cap	19			AP	PEN	2.8	2.6	2.2	1.7	1.4	0.4	0.1	

AW	0.6 Mag		DC	3	3	2	1	1	1	1
			MA	1	3	4	5	9	14	16
KD	3		BA	46	37	28	21	16	7	1
SAB	5		TOF	1	1	3	5	8	32	90

Glock Model 18 9mmP-This is a version of the Glock that fires full-auto. The gun represented here has the +2 magazine in it, there is also a 32-round magazine available for it to. Glock has deliberately designed many parts to not be compatible with the Glock 17 so as to prevent unauthorized conversions.

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Page last modified: September 10, 2000

Glock 20

Pistol

10mm

U.S.A. Data Provided by Greg Brovane

Physical Data		Aim Time				Ballistic Data Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	8	1	-17	FMJ	PEN	2.5	2.3	2.0	1.6	1.3	0.5	0.2	0.1
W	2.4	2	-11		DC	4	4	3	2	1	1	1	1
		3	-10										
RT	4	4	-9	JHP	PEN	2.4	2.2	1.9	1.6	1.2	0.4	0.2	0.1
ROF	*	5	-8		DC	6	5	5	4	3	1	1	1
		6	-7										

Cap	15		AP	PEN	3.3	3.1	2.7	2.2	1.7	0.6	0.2	0.1
AW	0.7			DC	4	4	3	2	1	1	1	1
	Mag											
KD	5			BA	47	40	32	25	20	11	5	2
SAB	4			TOF	1	1	3	5	8	27	68	153

Glock Model 20 10mm This is a slightly larger Glock that chambers the 10mm. The frame is also used for the Glock 21. This weapon has one of the largest magazines available in its caliber.

Send Comments

Page last modified: February 03, 2001

Glock 21

Pistol

.45 ACP

U.S.A. Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	8	1	-17	FMJ	PEN	1.7	1.6	1.3	1.1	0.8	0.4	0.2	0.1
W	2.4	2	-11		DC	3	3	2	2	1	1	1	1
		3	-10										
RT	4	4	-9	JHP	PEN	1.6	1.5	1.3	1.0	0.8	0.4	0.2	0.1
ROF	*	5	-8		DC	5	4	3	2	1	1	1	1
		6	-7										

Cap	13		AP	PEN	2.4	2.2	1.9	1.5	1.2	0.5	0.2	0.1
AW	0.9			DC	3	3	2	2	1	1	1	1
	Mag											
KD	5			BA	45	37	28	21	16	6	1	-3
SAB	5			TOF	1	1	3	5	8	18	30	43

Glock 21 .45 ACP-As mentioned under the Glock 20 entry, this is the larger frame Glock that chambers the .45 ACP. Needless to say this weapon has a very high magazine capacity for a weapon of its caliber.

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Page last modified: February 03, 2001

Glock 22

Pistol

.40 S&W

U.S.A. Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	7	1	-16	FMJ	PEN	1.8	1.7	1.5	1.2	1.0	0.3	0.1	
W	2	2	-11		DC	3	2	2	1	1	1	1	
		3	-10										
RT	4	4	-9	JHP	PEN	1.7	1.6	1.4	1.1	0.9	0.3	0.1	
ROF	*	5	-8		DC	4	4	3	2	1	1	1	
		6	-7										

Cap	15		AP	PEN	2.4	2.2	2.0	1.6	1.3	0.5	0.2
AW	0.6			DC	3	3	2	1	1	1	1
	Mag										
KD	4			BA	46	37	28	21	16	7	1
SAB	3			TOF	1	1	3	6	9	31	78

Glock 22 .40 S&W- This is a Glock pistol that fires the .40 S&W round.

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Page last modified: February 03, 2001

Glock 26

Pistol

9 mm P

U.S.A. Data Provided by Greg Brovane

Physical Data		Aim Time				Ballistic Data Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	6	1	-16	FMJ	PEN	1.8	1.7	1.4	1.1	0.9	0.2	0.1	
W	1.5	2	-11		DC	4	4	3	2	1	1	1	
		3	-10										
RT	4	4	-9	JHP	PEN	1.7	1.6	1.4	1.1	0.8	0.2	0.1	
ROF	*	5	-8		DC	4	4	3	2	1	1	1	

Cap	10		AP	PEN	2.4	2.3	1.9	1.5	1.2	0.3	0.1
AW	0.4			DC	2	2	1	1	1	1	1
	Mag										
KD	3			BA	45	36	28	21	16	5	1
SAB	3			TOF	1	1	3	6	9	34	96

Glock 26 9mmP- This is a super compact Glock in 9mmP.

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Page last modified: February 03, 2001

Glock 27

Pistol

.40 S&W

U.S.A. Data Provided by Greg Brovane

Physical Data		Aim Time				Ballistic Data Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	6	1	-16	FMJ	PEN	1.6	1.5	1.3	1.1	0.9	0.3	0.1	
W	1.5	2	-11		DC	2	2	1	1	1	1	1	
		3	-10										
RT	4	4	-9	JHP	PEN	1.6	1.5	1.3	1.0	0.8	0.3	0.1	
ROF	*	5	-8		DC	4	3	3	2	1	1	1	

Cap	9		AP	PEN	2.2	2.0	1.8	1.4	1.2	0.4	0.2
AW	0.4			DC	2	2	1	1	1	1	1
	Mag										
KD	4			BA	45	35	26	19	14	3	-1
SAB	3			TOF	1	1	3	6	10	33	82

Glock 27 .40 S&W- This is a super compact Glock in .40 S&W.

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Page last modified: February 03, 2001

LAR Grizzly .50 AE

Pistol

.50 Calibre Action Express

USA

Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	11	1	-19	FMJ	PEN	5.0	4.6	3.8	2.8	2.1	0.3		
W	3.8	2	-12		DC	9	8	8	7	6	1		
		3	-10										
RT	4	4	-9	JHP	PEN	4.8	4.4	3.6	2.7	2.0	0.2		
ROF	*	5	-8		DC	9	9	9	8	7	1		
		6	-7										

Cap	6	7	-6	AP	PEN	6.5	6.0	4.9	3.6	2.7	0.3
AW	0.5				DC	9	8	8	7	6	1
	Mag										
KD	9				BA	53	44	35	28	23	16
SAB	7				TOF	0	1	2	3	6	36

LAR Grizzly .50in AE-This Grizzly is based on the M1911 frame and is chambered for the .50in AE round.

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Page last modified: February 03, 2001

M1896 Mauser

Mauser M1896 "Broomhandle" (Mauser Selbstladepistole Construction 96)

Automatic Pistol

7.63mm Mauser

Germany

Data Provided by R.J. Andron

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	11	1	-17	FMJ	PEN	2.6	2.4	2	1.6	1.3	0.6	0.2	0.1
W	2.72	2	-11		DC	3	3	2	2	1	1	1	1
		3	-10										
RT	8	4	-9	JHP*	PEN	2.5	2.3	2	1.5	1.2	0.5	0.2	0.1
ROF	*	5	-8		DC	4	4	3	3	2	1	1	1
		6	-7										
Cap	10			AP	PEN	3.7	3.4	2.9	2.3	1.8	0.8	0.3	0.1

AW	0.26 CS		DC	3	3	2	2	1	1	1	1
KD	3		BA	46	38	29	22	17	8	3	-1
SAB	4		TOF		1	2	3	5	12	20	29

As one of the first successful autoloading pistols, the Broomhandle Mauser (called such because of the shape of its grip) used a stripper clip loading system. On loading, the clip containing 10 rounds was inserted into the breech, just atop the internal magazine. The individual rounds were then forced into the internal magazine. When the clip was removed, the breech snapped shut, allowing the M1896 to fire. If clips are unavailable, the magazine can be reloaded one round at a time.

The M1896 Mauser was available with a detachable stock, which could also serve as a holster for the weapon. The stock adds 1.0 to the weight of the pistol and extends the length to 25, but allows the following Aim Time ALMs:

Aim Time ALM

Aim Time	M1896	M32
1	-18	-19
2	-11	-11
3	-8	-8
4	-7	-7
5	-6	-6
6	-5	-5
7	-4	-4

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Page last modified: February 03, 2001

Mark 22 Model 0 "Hush Puppy"

Pistol

9 mm Parabellum

U.S.A. Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data Range in 2 yard Hexes								
		AC	ALM			10	20	40	70	100	200	300	400
L	13	1	-18	FMJ	PEN	1.2	1.1	0.9	0.7	0.5	0.2		
W	2.6	2	-11		DC	3	3	3	3	2	1		
		3	-10										
RT	4	4	-9										
ROF	*	5	-8										
		6	-7										
Cap	8												

AW	0.38 Mag								
KD	2		BA	45	37	27	20	15	6
SAB	3		TOF	1	1	3	5	8	18

Mark 22 Model 0 9mmP(Hush Puppy)-Is a special pistol used by navy SEALs in Vietnam. Only a few-hundred were made. The pistol slide can be locked for maximum silent operation.

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Page last modified: February 03, 2001

Olympic Arms OA-93

Pistol

5.56 mm NATO

U.S.A. Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data Range in 2 yard Hexes								
		AC	ALM			10	20	40	70	100	200	300	400
L	16	1	-19	FMJ	PEN	9.8	9.4	8.7	7.8	6.9	4.4	2.8	1.8
W	4.2	2	-10		DC	5	5	5	5	4	3	1	1
		3	-8										
RT	8	4	-6	JHP	PEN	9.2	8.9	8.2	7.3	6.5	4.2	2.6	1.7
ROF	*	5	-5		DC	7	7	7	6	6	4	2	1
		6	-4										
Cap	30	7	-3	AP	PEN	13.6	13.1	12.1	10.8	9.6	6.1	3.9	2.5

AW	1 Mag		DC	5	5	5	4	4	2	1	1
KD	3		BA	59	50	42	34	29	20	14	10
SAB	2		TOF	0	0	1	2	3	7	13	22

OA-93 5.56mm-This is a cut down M16 that has been made into a pistol. It uses a free-floating barrel and will also accept standard M16 magazines. This weapon is manufactured by Olympic Firearms, USA.

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Page last modified: February 03, 2001

SIG 229 357 SIG

Pistol

.357 SIG

Switzerland

Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data Range in 2 yard Hexes								
		AC	ALM			10	20	40	70	100	200	300	400
L	8	1	-16	FMJ	PEN	4.1	3.8	3.2	2.5	2.0	0.6	0.2	
W	1.9	2	-11		DC	6	5	5	4	3	1	1	
		3	-10										
RT	4	4	-8	JHP	PEN	3.9	3.6	3.1	2.4	1.9	0.5	0.2	
ROF	*	5	-8		DC	7	7	6	5	4	1	1	
		6	-7										
Cap	12			AP	PEN	5.4	5.0	4.3	3.4	2.7	0.8	0.2	

AW	0.5 Mag		DC	5	5	5	4	3	1	1
KD	5		BA	49	42	34	27	22	13	8
SAB	4		TOF	0	1	2	4	6	23	64

SIG 229 .357 SIG-This weapon is the same as the SIG in .40 S&W except there is a barrel conversion for the new .357 SIG round. The round uses the same magazine as the .40 S&W The .357 SIG is a high velocity .357 round that is essentially a bottlenecked .40 S&W. The version here exits the gun at 1400+ fps.

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Page last modified: February 03, 2001

SIG 229 40 S&W

Pistol

.40 S&W

Switzerland

Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data Range in 2 yard Hexes								
		AC	ALM			10	20	40	70	100	200	300	400
L	8	1	-16	FMJ	PEN	1.7	1.6	1.4	1.1	0.9	0.3	0.1	
W	1.9	2	-11		DC	3	2	1	1	1	1	1	
		3	-10										
RT	4	4	-8	JHP	PEN	1.6	1.5	1.3	1.1	0.9	0.3	0.1	
ROF	*	5	-8		DC	4	4	3	2	1	1	1	
		6	-7										
Cap	12			AP	PEN	2.3	2.1	1.8	1.5	1.2	0.4	0.2	

AW	0.5 Mag		DC	2	2	2	1	1	1	1
KD	4		BA	46	37	28	21	16	7	1
SAB	3		TOF	1	1	3	6	10	32	81

SIG 229 .40 S&W- This is a compact pistol chambered for the .40 S&W.

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Smith & Wesson 1076

Pistol

10mm

U.S.A.

Data Provided by Greg Brovane

Physical Data		Aim Time				Ballistic Data Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	8	1	-17	FMJ	PEN	2.4	2.2	1.9	1.6	1.3	0.4	0.2	0.1
W	2.9	2	-11		DC	4	4	3	2	1	1	1	1
		3	-10										
RT	4	4	-9	JHP	PEN	2.3	2.1	1.8	1.5	1.2	0.4	0.1	0.1
ROF	*	5	-8		DC	4	4	3	2	1	1	1	1
		6	-7										
Cap	9			AP	PEN	3.2	3.0	2.6	2.1	1.7	0.6	0.2	0.1

AW	0.7 Mag		DC	4	4	3	2	1	1	1	1
KD	4		BA	47	40	32	25	20	11	5	2
SAB	4		TOF	1	1	3	5	6	13	22	31

Smith&Wesson 1076 10mm-This weapon is part of the 1000-series weapons. In the late 80s Smith & Wesson introduced a new generation of autoloaders in 9mm, 10mm, .40S&W, and .45 ACP. The new autoloaders are represented by 4-digits, which the first two represent caliber and the last two represent features. The representative here is the 1076 which was used by the FBI. The gun data is for a normal load.

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Walther P88

Pistol

9mmP

Germany

Data Provided by Greg Brovane

Physical Data		Aim Time		Ballistic Data		Range in 2 yard Hexes							
		AC	ALM			10	20	40	70	100	200	300	400
L	8	1	-17	FMJ	PEN	2.0	1.8	1.6	1.2	1.0	0.3	0.1	
W	2.2	2	-11		DC	3	3	2	1	1	1	1	
		3	-10										
RT	4	4	-8	JHP	PEN	1.9	1.8	1.5	1.2	0.9	0.3	0.1	
ROF	*	5	-8		DC	4	4	3	2	1	1	1	
		6	-7										

Cap	15		AP	PEN	2.7	2.5	2.1	1.7	1.3	0.4	0.1
AW	0.6			DC	3	3	2	1	1	1	1
	Mag										
KD	3			BA	46	37	28	21	16	7	1
SAB	3			TOF	1	1	3	5	9	32	92

Walther P88 9mmP- Is a well made semi-automatic pistol manufactured by Walther in Germany.

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Morale Rules

OPTIONAL RULE:
Integrated Morale

Designer's Notes: These rules are an attempt to incorporate the human factor into Phoenix Command simulation. As combatants engage the enemy, a variety of factors will eat away at their effectiveness on the field. When bullets fly past a combatant, the natural reaction is to start being much more concerned about self preservation. Combatants will spend more effort molding themselves to cover, observing for the enemy, and hesitating before committing to action. All of these make combatants less effective on the battlefield. These types of reactions can be categorized as morale--the human factor determining the effectiveness of the combat unit.

This set of rules tries to simulate that and integrate it in an easy way with the normal flow of a PCSACS game.

THE RULES:

MORALE STATE

All combatants will now have a "Morale State" which can change between one of four states, which are listed on the table below.

Morale State	CA Multiplier	DSL Bonus	Spotting CA Bonus
Bold	1.0	+0	+0
Cautious	0.75	-1	+1
Frightened	0.5	-2	+2
Panicked	0.0	-4	+0

All combatants start at the Bold Level, unless otherwise specified in the scenario.

> ***Example:*** *A group of four bank robbers is holding guns on two corporate executives hostages. The leader of the robbers and one of his men start at the Bold morale state, while the other two robbers, who have had doubts about the robbery, start at the Cautious Morale State. The Hostages start at the Frightened and Panicked state.*

As can be seen from the above table, people in different morale states will have different levels of combat effectiveness. The columns in the table are defined as follows:

Morale State: A description of the person's behavior in a particular moment in a combat situation.

CA Multiplier: This is a multiple of the person's CA and represents the amount of Offensive CA the person is capable of taking in a phase. As the person's morale degrades, they are able to take fewer and fewer offensive actions, and their CA tends to be spent more and more on Defensive actions. In all cases, Offensive CA is rounded up to the nearest whole number. Offensive CA is CA spent on offensive actions--aiming, shooting, combat, moving towards an enemy, reloading a weapon, and so forth.

> ***Example:*** *One of the bank robbers is Green-quality (SL 2, 4 CA) and starts at Bold. When his morale state changes to Cautious, his offensive CA drops from 4 to (4 * 0.75 =) 3 CA. This means that he c an use 3 CA in offensive actions. He still has his 4 CA, but the remaining CA can only be used for defensive purposes.*

DSL Bonus: This number is the change to the combatant's DSL ALM and represents a person's tendency to make themselves a smaller target as he becomes more and more unsettled.

> ***Example:*** *Our bank robber's DSL is +3 under normal circumstances--when he is in a Bold Morale state. When his morale state changes to Cautious, his DSL changes from +3 to +3-1= +2, meaning he is taking more time in using cover and is trying to really avoid getting shot.*

Spotting CA bonus: This is the bonus number of CA which a combatant can spend on spotting attempts--if he so chooses. These CA are considered free CA and can be used in conjunction with other actions.

> ***Example:*** *Our bank robber (4 CA, 3 Offensive CA) who is now being Cautious, spends 1 CA diving over cover. He spends another CA getting up to kneeling and a third to assume a hip-firing stance. His final CA is spent trying to spot a police sniper down the street (>40 hexes). Because he is being cautious, he gains a Spotting CA bonus of +1. This gives him 2 CA of spotting, and he spots the sniper this phase where ordinarily, he would have had to wait until the next phase to spot the sniper -- (see Spotting PCSACS (4d) s 5.2). This gives him the effect of 5 CA in a phase.*

MAINTAINING AND CHANGING MORALE STATES

A combatant will stay at his initial morale state until one of the following events happens:

- The combatant is wounded
- The combatant is subject to a near miss from enemy fire
- The combatant sees his element leader injured.

Wounding:
If a combatant is wounded or injured, his morale state immediately drops to Panicked.

Near Miss:
If a shot passes within the combant's Critical Distance (PCSACS (4d) s. 5.6), the combatant will drop 1 morale state if the person is a combat veteran, and 2 morale states if the person is not a combat veteran. A combat veteran is defined as **anyone** who has been in combat.

> ***Example:*** *Our bank robber was barely missed by a police sniper when he was acting Bold, and so this near miss drops the bank robber's morale state to a lower level. The bank robber has been involved in some gang gunfights in the past, so he is considered a combat veteran, and so his morale state drops only one level--from Bold to Cautious. If the bank robber had no combat experience, then he would have dropped 2 levels--from Bold to Frightened.*

Element Leader Incapacitated:
An element leader is the highest skilled ally who is a) in command of the combatant, and b) within sight of the combatant. If the element leader is incapacitated, then the combatant immediately drops one morale level.

> ***Example:*** *Our four bank robbers have split into two teams in trying to make their getaway, and are following separate routes through the inner city. In a firefight with the police, the leader of the bank robbers is incapacitated. His companion, who started at a Cautious morale state, sees that his leader is down, and so his morale immediately drops one level to Frightened. The other team of bank robbers, which were out of sight of their leader, is unaffected by his incapacitation.*

RALLIES

A person can upgrade their morale level by performing a self-rally as described in PCSACS (4d) s. 5.6, with the following modification. A person can make a self-rally attempt once under cover, and if they succeed, then they raise their morale state up by one level. After their Rally Time in CA, they can attempt to raise their morale up by another level, and so on until their morale returns to bold.

If the combatant fails any self-rally, then their morale state remains frozen at its current level for the rest of the battle, or until a comrade makes a rally attempt as described in PCSACS (4d) s. 5.6. The only difference between a rally and a self-rally for our purposes is that a successful Rally attempt will immediately restore a combatant's morale state up to Bold.

NOTES

These rules have seen some playtesting across the internet and the responses that I have received from playtesters has typically been favorable.

One of the suggestions has been the addition of another morale state above the "Bold" state--either something like "Fanatical" or "Enraged," representing the morale state of people who are hyped up on emotion, adrenaline, and fervor.

For playtesting purposes only, the Fanatic rules are as follows: The effects of a Fanatical Morale state would result in a CA multiplier of 1.25, a spotting bonus of -1, and a DSL bonus of +2 -- meaning these people can do more, see less, and be hit much easier.

Fanatics can start a battle in the Fanatical state, and may not be returned to that state if their morale state is reduced over the course of the battle. Roleplaying GMs may choose to allow player characters (or NPCs) to become enraged in the course of roleplaying.

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OPTIONAL RULE:
Attribute Modifications

Fredrik Tegman has provided the following tables for modifiers for RR and ALM based upon HLT and Perception, respectively.

HLT Value	DT Modification
03-05	+2
06-08	+1
09-13	0
14-15	-1
16-17	-2
18-19	-3

The DT Modification indicates the number of rows the character can move up or down on Table 8A.

> **Example**: Jason, whose HLT has been ravaged by disease and is now at 8, is wounded for 800 PD. On table 8A, he moves up one row on the DT Column, treating his wound as if it were 900 PD, and reading his RR and RT information on the 900 PD row.

The following table provides modifications to ALM based upon a character's Perception attribute.

PER Value	ALM Modification
03-05	-2
06-08	-1
09-13	0
14-15	+1
16-17	+2
18-19	+3

Attribute Modifications

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Civilians

A sad fact of war is that civilians have never been safe from its effects. In low-intensity conflict, where war is common-place, the skirmishes can start anywhere and without the oppor-tunity for civilians to leave the field to the combatants. As a result, many civilians find themselves running to cover or to rescue what possessions and loved ones they can as the war sweeps over them. The following rules provide a method of resolving the actions of civilians caught in the crossfire.

All civilians are handled by the referee or the responsibility is shared equally among the players if there is no referee.

Civilians' actions are determined by dice rolls.

Once every ten phases, the referee should make two 0-9 rolls for every civilian and index the results in the respective columns on the following table after applying the appropriate odifiers. The first roll determines the civilian's disposition, while the second roll determines the basic behavior pattern which the civilian will follow for the next ten phases. The referee should make a note of this pattern and try to have the civilian act accordingly.

Civilian Actions Table

Roll 0-9	Demeanor	Roll 0-9	Actions
0-1	Fearful	0-2	Leave Battlefield
		3-7	Go to cover & cower
		8+	Call for help--cry out

2-5	Cautious	0-1	Shock. No movement. Nonresponsive
		2-4	Go to cover & cower
		5+	No action. Ignore combatants
6-7	Protective	0-2	Go to cover & cower
		3-7	Move to goal* and protect goal
		8+	Move to goal* and physically remove goal from danger
8+	Aggressive	0-3	Go to cover & cower
		4-6	Seek and move towards weapons**
		7+	Move to attack "most dangerous" enemy

Modifiers	First Roll	Second Roll

Hated authority present	-1	1
Abusive authority present	-2	-1
Hated non-authority present	0	1
Abusive non-authority present	-2	-1
Civilian already under cover	0	-1
Civilian already armed	1	1
Other civilians under attack	1	3
Loved one endangered	2	5

Notes:

Treat any unmodified rolls of less than zero as zero.

* - A goal is something that the civilian values or cherishes quite highly, such as a spouse or child, but may also include valued possessions, such as cash, valuables, or heirlooms. If there is no goal appropriate in the scenario, treat this result as “Go to cover & cower.”

** - If the civilian already has a weapon, this becomes a result of “Move to attack the ‘most dangerous’ enemy.” The most dangerous enemy is solely in the eyes of the civilian.

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Mob Actions and Riots

These rules provide the Phoenix Command Referee with a method of managing a riot. They determine when a riot will start and will resolve the actions of a rioting mob. Although the Mob Actions and Riots rules are primarily designed for use in solo scenarios, rules are provided for agitator troops who sometimes can control parts of the rioting mob. A second player, controlling the agitators, would be able to play against the riot control forces player.

Riot Stages: Every riot undergoes identifiable stages where all of the individuals in a riot follow certain behavior patterns. The average riot will advance through the **crowd**, **riot**, **riot advance**, and **skirmish-line** stages. There is also the possibility that as each stage advances, the level of weapons used by the rioters will increase both in number and quality.

Crowd Stage: All riots will start at the **crowd** stage. Here, the people are gathering peacefully. None of the crowd members should be moved on the game map at this stage. Threat level starts at I unless otherwise specified or earlier raised.

A special set of conditions is required to encourage normally law-abiding people to begin rampaging and attacking the symbols of authority. First, there must be a crowd or large group of people which have gathered for one purpose—either protesting, partying, or any other reason. Second, respect for government authority among the crowd must have disappeared. Third, there must be some sort of triggering event, like the arrest of a popular figure, or an attack on the crowd by the authorities. Another trigger may be the actions of a single crowd member or group from the crowd in leading an attack on the riot-control troops.

Use the following table to determine if the situation advances to the **riot** stage. Roll 00-99 once every 10 minutes and if the roll is less than or equal to the modified chance of a riot, then the riot stage exists.

BASE CHANCE OF RIOTING **Economic Riots:**	**Base Chance**
Unavailablity of standard goods or services	00
As above, but with high taxes	20

As above, but with prevalent starvation (starvation present in 20%+ of population)	40
Political Riots	
Perceived repression of dissent	20
Perceived repression of civil liberties	30
Violent repression of dissent or civil liberties	30
Perceived persecution for political, ethnic, or religious traits	50
Modifiers:	
Crowd Size	**Modifier**
Up to 99	+10
100 to 499	+30
500 to 1000	+50
Over 1000	+60
Guards	
None	+20
1 guard for every 20 people	+0
1 guard for every 10 people	-20
1 guard for every 5 people	-50
Mounted guards or riot control vehicles present	-20
Incitements	

Agitators inciting riots	+2*SL
Crowd ordered to disperse (Riot Act)	+5
Violent attack on crowd by authorities	+20

Notes: SL is the Diplomacy SL of the commanding agitator in the crowd.

Riot Stage: Once the **riot** stage exists, there is the potential for violence among the individuals and, possibly, the crowd as a whole. The idea that a person in a crowd situation surrenders his will to that of the rioting crowd is incorrect. Each person in a crowd retains his individuality and full control over his own actions, but is subject to external forces which may modify his decisions such as the apparent formation of a norm of behaviour, or the implied threat of harm to non-conformists. So, if an individual in a crowd begins to display violence, others in the crowd may take his violence as a signal that his actions are normal behaviour for the crowd, and act accordingly.

At the riot stage, it is essential to determine whether the individuals in the crowd turn the crowd as a whole towards violence. The crowd does not move at this stage. Instead, the referee or player rolls a 00-99 on the following table after 10 minutes to determine the crowd actions. If the crowd proceeds to **riot advance** stage, then the crowd is already disposed towards violence.

Roll Result

00-19 Passions die down. Riot reverts to crowd stage.

20-34 Continue in riot stage for another (10) minutes.

35-99 Proceed to Riot Advance Stage.

Die Roll Modifiers:

Authority Actions

-10 No action by authorities.

+15 Crowd verbally ordered to disperse by authorities.

+30 Crowd perceived as attacked by authorities.

Authority Numbers

0 1 guard for every 20 people.

-20 1 guard for every 10 people.

-50 1 guard for every 5 people.

-20 Mounted guards or riot-control vehicles present

Agitator Actions:

+2 * SL Agitation by agitator troops. SL is highest Diplomacy SL of agitator troops.

Riot Advance Stage: In this stage, the rioters begin to move towards the positions of the riot-control troops at a steady walking pace of 1 HPP. Roll a 00-99 every 10 phases and compare it with the distance of the rioters from the main body of troops. If the roll exceeds the distance, then the advance stops and a skirmish line forms at that point. Agitators may try to move the crowd closer to the riot-control troops by subtracting 2 times their commander's Diplomacy SL from the die roll.

Skirmish Line Stage: Scenarios in most scenarios will start with the skirmish line already formed. The skirmish line is a line of rioters roughly parallel to the main body of the riot control troops. It is a staging area for small clusters of rioters to launch attacks on the riot control troops or other targets.

Each cluster consists of 5 rioters. All the rioters in a cluster will behave in the pattern determined by rolling on the Cluster Actions Table below.

Rolls for cluster behavior are made once every 10 phases. At the start of a ten-phase period, make a 0-9 roll and note the result. This roll is used to determine the values of modifiers with random components for the period. Next, a 00-99 roll is made for each cluster. By indexing the roll on the Cluster Actions Table under the appropriate threat level, a pattern of behavior is determined for each cluster for the next 10 phases.

Riot Cluster Actions Table

Threat Level	Roll	Behaviour
I	0 - 2	Crowd disperses, riot ends
	3 - 7	Cluster leaves battlefield
	8 - 55	Aggressive shouting - no other action
	56 - 85	Cluster advances to verbally challenge riot troops
	86 - 99	Cluster advances to melee riot troops
	100+	Increase threat level to 2
II	0 - 1	Decrease threat level to 1

	2 - 11	Cluster routs
	12 - 24	Aggressive shouting - no other action
	25 - 45	Cluster advances to melee riot troops
	46 - 85	Cluster moves up and discharges missiles
	86 - 95	Cluster charges
	96+	Increase threat level to 3
III	0 - 2	Decrease threat level to 2
	3 - 20	Cluster routs
	21 - 27	Aggressive shouting - no other action
	28 - 52	Cluster advances to melee riot troops
	53 - 75	Cluster moves up and discharges missiles
	76 - 92	Cluster charges
	93+	Increase threat level to 4
IV	0 - 9	Cluster routs
	10 - 14	Aggressive shouting - no other action
	15 - 40	Cluster advances to melee riot troops
	41 - 75	Cluster moves up and discharges missiles
	76 - 99	Cluster charges
	100+	Cluster obtains firearms and opens fire.

Modifiers

Authority Actions:

Physical Barriers established	-10
Police personnel line established	-5
Riot police personnel line established	-15
Military personnel line established	-20
Armoured vehicles present	-5
Mounted police present	-5
Gas weapons used on rioters	+(10)-6
Water cannons used on rioters	+(10)-4
Batons/plastic bullets used on rioters	+(10)-5
Firearms presented and aimed at rioters	+4(10)-20
Live ammunition discharged at rioters	+6(10)-30
Dogs used on rioters	+(10)-8
Electrical Prods or “non-lethal” weapons used on rioters	+3(10)-15
Rioters severely wounded (>200 PD)	+3(10)-10
Rioters slain	+5(10)-15
Rioters in melee with authorities	+3(10)-5

Example: *Street riots have degenerated horribly with riot police opening fire on crowds and killing two rioters. At the start of a ten-phase period, the player rolls a 7 on a 0-9 roll. Then, he rolls to determine what each of three clusters will do for the next ten phases. The threat level is III.*

Applicable modifiers are "live ammunition discharged at rioters" [+6(10)-30] and "rioters slain" [+5(10)-15]. Since the 0-9 roll at the start was a 7, the modifiers become (6x7)-30 = 12

and (5x7)-15 = 20 respectively for a total modifier of +30.

Modified 00-99 rolls for the three clusters produce 45, 120, and 75, meaning that two clusters will be advancing and attacking riot control troops with missile weapons this period, and the cluster that had the 120 result will be doing nothing but prepare for Threat Level IV actions next period. Next period all clusters will roll at Threat Level IV for their actions.

Agitators must also roll under their SL on a (10)-2 for each of up to two clusters they may command as if the clusters were composed of agitator troops. These rolls are made every 10 phases and replace the respective clusters' rolls on the Cluster Actions Table. Role players should use a Diplomacy or "Agitator" skill roll at Base Odds of 6 instead of the above (10)-2 roll.

Charges: Charges occur almost spontaneously, but usually follow the charges of individual clusters within the mob. If a cluster's actions designate a charge, roll a (10). If the number rolled is less than or equal to the number of clusters which are charging in that phase, then the entire skirmish line charges.

The charge is a headlong run to contact and attempt to overwhelm the riot-control troops. The skirmish line moves at 4 HPP towards the troops and past them if possible. Riot troops, once engaged, will take damage from the group of rioters each phase depending on the rioters' numbers and the threat level of the riot (see below, under INJURIES).

Routs: While in the skirmish line, a cluster may roll a "rout" result. This means that the entire cluster leaves the field in a panic and no longer takes part in the riot. Their leaving may cause the rest of the crowd to rout as well. If a cluster's actions indicate a rout result, roll a (10). If the number rolled is less than or equal to the number of clusters routing, then the entire skirmish line routs.

For situations where there are charges and routs indicated for different clusters, roll for both charges and routs, with charges taking priority. For example, if a crowd has clusters charging and others routing, the gamemaster would roll a (10) to check if the line charges. If the roll indicates the line charges, no further rolls are made, and the line begins its charge. Any clusters shown as routing continue to rout. However, if the crowd does not charge, then the gamemaster rolls to see if the crowd routs. If a rout is indicated, the line routs, but clusters shown as charging would continue to charge.

Threat Level: The threat level of a riot is a measurement of the type of weapons used by the rioters. Naturally, the threat level has an impact on rioter actions and on injuries suffered by the targets of rioters.

Threat Level I: The crowd is simply protesting. Weapons are not much more than insults. Any enemy caught in the crowd will suffer from moderate blows.

Threat Level II: The crowd is enraged and is using missile weapons such as rocks and vegetables. Melee combat shows average blows, and blunt weapons may be present.

Threat Level III: A serious riot where the crowd is using potentially lethal missiles such as boulders, glass, and petrol bombs. Melee weapons include both edged and blunt weapons.

Threat Level IV: This is a more frenzied form of Threat Level III. Certain clusters are using firearms if available. Crowds tend to disperse in panic at this stage, leaving the battle to armed rioters. The situation tends to resemble urban insurgency.

Threat levels are raised immediately on the appropriate roll on the Cluster Actions Table. All subsequent clusters will roll at the increased threat level. The same applies to threat level reduction on

the Cluster Actions Table.

Another method of reducing the threat level is through the dispersal of the crowd. For each dispersal, the threat level drops by one step and the next crowd stage begins at the reduced threat level. This will work on threat levels I to III. Level IV threat levels can only be reduced by a crackdown and 24-hour curfew, and are more suited to role-playing situations than skirmishing.

Injuries: People caught and attacked within the mob can be severely injured. These injuries vary according to the threat level as outlined on the following table. The table gives the average amount of PD taken per phase from melee combat by various targets at the different threat levels. To use the table, index the armour type of the target individual with the threat level. The first number gives the PD taken from each rioter per phase if the target is without a helmet, while second number gives PD taken with a helmet. A target can have up to 6 rioters attacking him. Simply multiply the damage listed on the table by the number of rioters attacking that phase. No such table is provided for thrown weapons. These should be resolved as individual attacks.

Note that this table should be used for skirmish scenarios only. If the referee is simulating a riot involving Player Characters in a roleplaying setting, then the attacks of the rioters on individual player characters should be gamed out using the melee combat rules.

> ***Example:*** *An unarmored target without a helmet is caught standing in a riot at threat level II. He has 6 rioters on him, the maximum allowed. He takes 62 PD per phase from blows from fists, kicks, and blunt weapons from one rioter, so his total PD taken per phase is 62 * 6 = 312 PD.*

Melee Damage from Riots

Threat Level		I		II		II/IV	
Target Armour	**Stance**						
Unarmored	Stand	3	2	62	17	70	20
	Kneel	5	3	201	46	240	55
	Prone	11	5	203	47	241	55

Light Flex	Stand	2	1	54	9	61	11
	Kneel	4	2	179	24	214	29
	Prone	9	3	181	25	215	29
Medium Flex	Stand	1	1	53	8	59	9
	Kneel	4	1	175	19	209	23
	Prone	8	2	176	19	210	23
Heavy Flex	Stand	1	1	52	7	59	9
	Kneel	4	1	174	18	208	18
	Prone	8	2	175	18	208	22
Rigid/Plate	Stand	1	1	52	7	59	8
	Kneel	4	1	174	18	208	22
	Prone	8	2	175	18	208	22

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Phoenix Command Air Support

Eero Juhola has come up with an amazing set of air support rules.

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Phoenix Command Air Support Rules

by Eero Juhola

1.0 INTRODUCTION

For years I used to wing it whenever the players called in some air support. For the 1998 RopeCon I needed a quick and dirty Vietnam-era tactical air support system. Quick, because it was only two weekends 'til the Con and I was awful busy preparing. Dirty, because the focus was supposed to be on the player characters on the ground.

So in July of 1998 I published the first, rough draft of these rules. Two weeks later at the convention I knew they were worth the effort when my group of players yelled and screamed, attracting the attention of just about everyone in the huge room, as the scenario's first F-4 came in low, dropping 500 lb bombs smack on enemy positions plotted by the player characters...

With another convention coming later this summer, it is time for a new revision of the rules... The main additions are more bombs and rules for rockets and strafing, for improvised AA fire by ground troops and propeller-driven planes for WWII scenarios.

Unfortunately I lack the time to test these rules and to write them out in a clear, organized manner but I hope their publication will add some excitement to the List. I will attempt to rewrite all of this material later. For the moment however you are stuck reading untested, unclear scribblings of a GM who is way too busy as it is. Please consider everything here as a work in progress, not as a rules beta test. The tables are messy, the rules confusing and the examples have yet to be debugged.

These rules are not intended to be a true simulation of air-to-ground attacks, for that they are far too simplistic and the subject is so hideously complex to be out of the scope of the game, rather they provide a means of resolving them in a way conveying the feel of being in the middle of an air strike...

My thanks for List members who gave feedback the last time, hope to get some more this time.

Send Comments

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Phoenix Command Air Support Rules Vietnam Air Strike

2. VIETNAM-ERA AIR STRIKE WITH AIRBORNE FAC

2.1 CO orders FO to call in air support is needed

2.2 FO calculates position

2.3 FO calls FAC, explains situation and gives coordinates

2.4 FAC checks with flight controller

2.5 FAC gives orders to fighters

2.6 FAC comes in for a look-see

2.7 FAC checks fighters are in a position to begin run

2.8 FAC tells FO he'll mark the target

2.9 FAC makes run over target and shoots a WP rocket

2.10 FAC gives final orders to fighters

2.11 Fighters come over target and drop their loads.

2.12 FAC asks FO if more air support is required

2.1. CO orders FO to call in air support is needed

The CO gives order to call in an air strike. "Get me some napalm on those Charlies on that thar hill". 12 AC (6 s).

2.2. FO calculates position

FO Makes the necessary calculations. Use Plot Time from Artillery Supplement.

2.3. FO calls FAC, explains situation and gives coordinates

FO contacts FAC, authenticates, explains situation, gives coordinates etc. This is included in the Plot Time.

2.4. FAC checks with flight controller

2.5. FAC gives orders to fighters

FAC checks with flight controller and talks to the fighters. 60-180 AC (30-90 s).

2.6. FAC comes in for a look-see

FAC comes in low to check the situation for himself. The enemy have a 2% chance to shoot him down with small arms. 60 AC (30 s).

2.7. FAC checks fighters are in a position to begin run

FAC checks with fighters and gives them the full briefing. 120-360 s.

2.8. FAC tells FO he'll mark the target

2.9. FAC makes run over target and shoots a WP rocket

FAC tells FO he's about to come in and does his marking run. The enemy have a 2% chance to shoot him down with small arms. He shoots his WP rocket. Treat this as a WP grenade for damage. Roll for FAC proficiency:

FAC Quality Table			
Roll	**FAC Quality**	**SAL**	**Position Error**

1	Line	10	15
2-4	Crack	11	12
5-6	Elite	12	11
7-8	Elite	13	10
9-0	Outstanding	14	9

The FAC will aim for a hex which is situated in a random direction, at a distance of (FO Position Error + FAC Position Error) from the FO's Plotted Hex.

	ALM
Pilot Quality	Varies
Aim time 2 Impulses	-12
He shoots the rocket from 50 hex distance	5
Cessna’s stability	5
Cessna’s gunsight	5
Speed	-10
Target is a hex	15
Visibility Modifiers	Varies

Roll for to hit on the Single Shot table. If he misses, use standard missing procedures for grenades etc. to find out by how many hexes he misses.

The total marking run takes 30 s.

2.10. FAC gives final orders to fighters

The FAC checks with FO if that's where the FO wants it. If the FO uses 10 AC to spot the impact site, he can give better instructions to the FAC (substract one third

of the FO's Position Error from the FAC's Position Error).

The FAC then gives final instructions to the fighters, i.e. to aim x meters the direction y from the smoke. 30-60 s.

2.11. The Attack Runs

The first fighter will now make his run.

Roll for fighter pilot proficiency using the Vietnam War Fighter Pilot Proficiency Table (QDAS-1), below.

QDAS-1a: Vietnam War Fighter Pilot Proficiency Table:

Navy	Air Force	Marines	South Vietnam	Pilot Quality	SAL	CA	Position Error
-	-	-	1-2	Militia	5	2	45
-	-	-	3-7	Green	7	3	30
1	1-2	1	8	Line	10	4	15
2-4	3-6	2-5	9	Crack	11	4	12
5-6	7-8	6-7	0	Elite	12	4	11
7-8	9	8-9	-	Elite	13	4	10
9-0	0	0	-	Outstanding	14	4	9

2.11.1 Bombs

Use this section if the plane is attacking the target using standard "iron" bombs.

The pilot will aim for a hex which is situated in a random direction, at a distance of (FAC Position Error + Pilot Position Error + (0.5xnumber of hexes between FAC's Plotted Hex and marking rocket's impact hex)) from the FAC's Plotted Hex.

Planes are not restricted by Moving Table 4D restrictions on Aim Time when aiming at a target on their flight path.

If we estimate the drop altitude as 50 meters, the bombs will have to be dropped at about two to three seconds before the target hex, i.e. at a distance of some 240 to 360 hexes.

	ALM 'Nam Jet	ALM WWII Prop
Pilot Skill SAL	From QDAS-1	From QDAS-2
Aim time 2 Impulses	-12	-11
He drops bombs from 300 hex distance	-8	-8
Stability & Bomb Sight	18	6
Speed	-10	-10
Target is a hex	15	25
Visibility Modifiers	Varies	Varies

Roll for to hit on the Single Shot table. If he misses, use standard missing procedures for grenades etc. to find out by how many hexes he misses (whether the first bomb drops long or short). Roll for the Left-Right Position Error in left-right direction using the following formula:

Left-Right Position Error = 22 - SAL - d10

The first bomb will be offset by Left-Right Position Error number of hexes to the left (50%) or to the right (50%) of the aiming point. The first bomb released will be on the left hand side of the aircraft. Every other bomb will be displaced two or three hexes to the right since they are released from the right hand side of the plane.

Example: An A-4 fighterbomber closes in at 450 knots speeds by at some 253 yards per phase (231 m/s, 63 hexes per impulse). Assuming a half a second release between bombs in a salvo, they will land 63 hexes apart, spreading the ten bombs over an area of over 600 hexes.

So one would think that the release interval must be shorter, say 0.1 second. Now the bombs will land 13 hexes apart. I suppose there might be several ways of releasing bombs depending on mission / target. Take your pick:

With a Plane Speed of 450 knots:

Number of Bombs	Release Interval (s)	Bomb Interval (hexes)	Length of target area (hexes)
10	0.05	6	64
10	0.1	13	127
10	0.15	19	181
10	0.2	26	244

To account for changes in aircraft attitude, air pockets, flak, contour of the ground, whatever: For every bomb after the first one roll a d10 to determine exact distance from previous bomb:

Bomb Interval Scatter Table		
Roll	**Adjustment to interval**	
1	-3	Hexes to interval
2	-2	Hexes to interval
3	-1	Hexes to interval
4-7	0	Hexes to interval
8	+1	Hexes to interval
9	+2	Hexes to interval
0	+3	Hexes to interval

For effects of bombs, see the section X. MUNITIONS, below.

The total bombing run takes 15 s per plane. The enemy has a 1% chance of

downing the fighter using small arms fire. There will be an interval of maybe 10 seconds between planes so that shrapnel is gone by the time the next plane arrives.

2.11.2 Napalm

Use this section if the plane is attacking the target using napalm containers.

The pilot will aim for a hex which is situated in a random direction, at a distance of (FAC Position Error + Pilot Position Error + 0.5 x number of hexes between FAC's Plotted Hex and marking rocket's impact hex)) from the FAC's Plotted Hex. Because napalm is an area weapon, it is generally not dropped exactly on target hex, but rather aimed to impact some distance before it. Once you have calculated the pilot's aim hex as detailed above, move it by 50 hexes in the direction of the plane. This then becomes the new aim hex.

Use the systems detailed in 2.11.1 to determine exact hexes where the napalm tanks hit the ground. For effects of napalm, see the section X. MUNITIONS, below.

2.11.3 Rockets

Use this section if the plane is attacking the target using air-to-ground rockets.

The main differences between bombs and rockets are that rockets are self-propelled and faster than the fighters that fire them; they can be aimed at targets from farther away using more primitive sights than bombs. In addition, they carry smaller payloads and are usually fired in salvoes, saturating an area. Rockets are ideally suited for destroying small or mobile targets such as pillboxes or vehicles.

The pilot must choose how many rockets he will be firing.

If directed by a FAC the pilot will aim for a hex which is situated in a random direction, at a distance of (FAC Position Error + Pilot Position Error + (0.5 x number of hexes between FAC's Plotted Hex and marking rocket's impact hex)) from the FAC's Plotted Hex.

Use FAC Position Error 0 if the pilot is relying on his own spotting only.

This is the aiming point of the salvo.

ALM 'Nam

Plane Type	Jet
Pilot Skill SAL	From QDAS-1
Aim time 2 Impulses	-12
He fires the rockets from 200 hex distance	-5
Jet's stability + bombsite	18
Speed	-10
Target is a hex	15
Visibility Modifiers	Varies

Roll for to hit on the Single Shot table. If he misses, use standard missing procedures for grenades etc. to find out by how many hexes he misses (whether the rocket strikes long or short). Roll for the Left-Right Position Error in left-right direction using the following formula:

Left-Right Position Error = 18 - SAL - d10

The aiming point of the salvo will be offset by Left-Right Position error number of hexes to the left (50%) or to the right (50%) of the aiming point stated by the player.

For each of the rockets in the salvo, find out the rocket's Position Error using this formula:

Position Error = 20 - SAL - d10

To account for changes in aircraft attitude, air pockets, flak, contour of the ground, whatever: For every rocket one roll a d10 on the table below and add the result to the Position Error:

Rocket Interval Scatter Table		
Roll	**Adjustment to interval**	
1	-3	Hexes to interval
2	-2	Hexes to interval

3	-1	Hexes to interval
4-7	0	Hexes to interval
8	+1	Hexes to interval
9	+2	Hexes to interval
0	+3	Hexes to interval

The rocket will strike a hex in a randomly determined direction Position Error number of hexes from the previous rocket impact point. Repeat the procedure until all rockets in the salvo have been accounted for.

For effects of rockets, see the section X. MUNITIONS, below.

2.11.4 Strafing

When strafing, the plane will come in low and engage the enemy with machine guns and cannon. Unlike bombing and other explosive area weapons, the effect of strafing is heavily dependent on the pilot spotting what he intends to attack.

The pilot may begin spotting as soon as the GM declares it practical. Usually this will be from a distance of at least three kilometers out. He can begin shooting as soon as he has spotted a target or a marking rocket fired by a FAC or other target marker and he is within range of his guns.

Before firing the pilot must decide whether he will be spreading his fire among several targets (standard rules for Minimum Arc are used) or if he concentrates on only one target. He also needs to decide how many CAs he will aim.

	ALM
Pilot Skill SAL	Varies
Aim time 2 Impulses	-12
He fires the guns from 200 hex distance	-5
Jet’s stability	11
Jet’s gun sight	13
Speed	-10
Target is a hex	15

Shooter not looking (if not spotted target)	-14
Visibility Modifiers	Varies

Roll for to hit on the Automatic Fire table. If he hits, roll for number of hits according to standard procedures, using Minimum Arc rules.

If he misses, use standard missing procedures for grenades etc. to find out by how many hexes he misses (whether the burst goes long or short). In addition, roll for the Left-Right Position Error in left-right direction using the following formula:

Left-Right Position Error = 16 - SAL - d10

Assuming he has enough ammunition, the pilot can continue firing on his target for as long as his plane is no more than one impulse's flight time away from the target. At this point he must pull his plane's nose up in order to avoid crashing into the ground. Pulling up requires one CA so Militia or Green quality pilots might need to pull up earlier.

Example: A Fokker D.XXI fighter closes in at 205 km/h (57 mhexes per Phase, 14.2 mhexes per Impulse). It is armed with four .30 cal Browning MGs with a rate of fire of 1000 rpm.

A Messerschmitt Me-109 G-2 fighter closes in at 312 km/h (86.7 mhexes per Phase, 21.7 mhexes per Impulse).

An F-105 Thunderchief fighterbomber closes in at 450 knots speed (some 253 yards per phase, 231 m/s, 63 hexes per impulse, 58 mhexes per impulse). It is armed with a 20mm Vulcan cannon with a rate of fire of 6600 rpm (ROF 58) and a CAP of 1029.

Assuming that the plane's angle of attack is such that the point where the guns are aimed at is only moving by one third of the plane's velocity, or 21 hexes per impulse. Use the standard rules for burst's chance to hit at MA 21.

2.12. The FAC asks the FO if he wants some more air support. (30 s.)

3. VIETNAM-ERA AIR STRIKE WITH FAC ON THE GROUND

With a FAC on the ground, the air strike is called in quicker but it will be less accurate as the FAC will probably be unable to mark the target and observe results. The FAC may use smoke to mark his own position, and landmarks and other prominent terrain features to explain where the fighters need to strike.

3.1 CO orders FO to call in air support is needed

3.2 FO calculates position

3.3 FO calls FAC, explains situation and gives coordinates

3.4 FAC checks with flight controller

3.5 FAC gives orders to fighters

3.6 FAC checks fighters are in a position to begin run

3.11 Fighters come over target and drop their loads.

3.12 FAC asks FO if more air support is required

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Phoenix Command Air Support Rules Vietnam Air Strike

4.0 MEN AGAINST PLANES

This section is for those players who wish to resolve improvised anti-aircraft fire by ground troops in a detailed manner. These rules are at present not intended to be used for simulating AA gunnery work done with proper anti-aircraft guns and the like.

If the rules in this section bog down the game too much, it is suggested that the players use a flat 1% chance for a ground unit of any size downing an attacking jet, 2% for downing an attacking propeller plane and 3% for downing a FAC or a helicopter.

4.1 TO HIT

To hit a plane, normal rules are used.

If the plane engaged is performing strafing or rocket firing, use distance calculated normally for range. If the plane is dropping iron bombs or napalm, add 2d100 hexes for altitude for jets, 1d100 hexes for propeller planes since the plane is coming in higher.

The PCCS Odds of Hitting Table 4D gives Movement Modifiers for targets. However these modifiers are for ground targets only. It is much more difficult to estimate the flight path of an airborne target and thus an additional –10 ALM is received in addition to whatever result is obtained from Table 4D.

A plane which is headed for or receding from the character in a 30 degree or smaller angle is considered to be coming head-on. This is one of the easier angles from which to hit a plane, the plane's flight path is more

predictable and there is less need to give the target lead. Use head-on target size and to hit modifier. Two CA of aim are allowed for gunners without an AA mounted weapon, up to four CA are allowed for gunners with AA mounted weapon.

If the target is passing by the shooter at an angle which is more than 30 but less than 60 degrees, the plane is considered oblique. The plane's flight path is difficult to estimate. Use the side target size and the oblique to hit modifier. Only one CA of aim is allowed.

If the target is passing by the shooter at an angle which is more than 60 degrees, the plane is considered oblique. The plane's flight path is difficult to estimate and the plane passes by very quickly. Use the side target size and to hit modifier. Only one CA of aim is allowed.

4.2 DAMAGE

Roll on the appropriate Hit Location Table as determined by the plane's configuration and angle.

Due to the velocity of the plane, bullets striking it from the front have much more PEN and thus higher damage potential. Conversely, bullets striking the plane from the rear have a much reduced PEN and correspondingly lower chances of damaging plane components.

In any case the chances of bringing down an airplane with non-exploding, rifle caliber ammunition is quite small.

4.2.1 ENGINE

A lucky hit to the engine will break something vital, causing the plane to lose all engine power.

Engines are often protected by armor on ground-attack planes.

Inline engines are more susceptible to small-arms damage due to their radiators - a single bullet may puncture the radiator, eventually causing the engine to overheat. Symptoms of punctured radiators include white trails of glycol behind the plane.

Symptoms of engine hits include Loss of power, loss of all power, runs rough. Smoke, leaking oil etc.

A plane catching fire while on an attack run must abort it immediately and head for home - often the plane will soon crash.

4.2.2 FUEL

Fuel hits puncture the plane's fuel tanks, causing leakage or even fire. Many planes are equipped with self-sealing tanks while older types often are not. Fuel tanks are sometimes armored. Use Fuel hit table of Mechanized supplement. Fuel tanks which are located right behind engine exhausts add anadditional Fire Modifier 5.

A plane exploding due to fuel hit will kill its crew unless they are equipped with ejection seats. Ejection seat equipped crew members must roll for proficiency and have seats which permit ejection in the altitude they are presently in. A plane catching on fire while on an attack run must abort it immediately and head for home - often the plane will soon crash.

4.2.3 PILOT

Pilot hits penetrate the plane' crew compartment, possibly hitting crew members and definitely causing them great concern. The pilot's seat is almost always armored against fire from the rear and sometimes against other directions as well. In addition, armored glass is used on most plane cockpits. Use standard PCCS resolution for hits on crew members.

4.2.4 FUSELAGE

Fuselage hits represent damage to the plane's structural integrity. Small arms have little chance of causing a plane to break apart. However holes in the plane will induce vibration making it harder to hit targets. For every 15 rifle-caliber or smaller holes or every five 12mm or bigger holes in the plane add ALM -1 to pilot's hit chance.

In addition, there is a 2% chance per fuselage hit that a cable controlling the rear control surfaces of the plane has been severed. On early planes without backup systems this will cause problems (see CONTROL SURFACES, below).

4.2.5 WING

Hits to wing represent damage to the plane's structural integrity. Small arms have little chance of causing a plane to break apart. However holes in the plane will induce vibration making it harder to hit targets. For every

15 rifle-caliber or smaller holes or every five 12mm or bigger holes in the plane add ALM -1 to pilot's hit chance.

In addition, there is a 2% chance per wing hit that a cable controlling wing control surfaces has been severed. On early planes without backup systems this will cause problems (see CONTROL SURFACES, below).

4.2.6 CONTROL SURFACES

Hits to the control surfaces of the tail and wings have detrimental effects on the plane's handling characteristics. For every five hits on control surfaces, an ALM modifier of -1 is added to any ground attacks made by the plane.

Hits to cables controlling the control surfaces will sever the cable, causing an ALM modifier of -8 to any ground attacks made by the plane and force the plane to head for home immediately after the current attack run. Planes with backup control systems (most WWII and later planes) are immune to this effect.

4.2.7 HYDRAULICS

On planes which have hydraulics systems, this hit location represents damage to landing gear, flaps and other systems operated by hydraulic systems and sometimes result in a spray of fluid trailing the plane. A hydraulics leak does not render a plane unable to fly, however the plane will often be slowed down (landing gear dropping down, etc.) and there may be problems landing.

4.2.8 LANDING GEAR

Hits to this location cause punctured tires and weakening of the landing gear. Like hydraulics hits, hits to the landng gear do not necessarily cause the plane to plummet to the ground but may prove troublesome later.

4.2.9 RADIO

Damage to the plane's radio systems. Any damage to the radio proper will result in loss of communication. Damage to radio aerials will result in reduced range of communication.

4.2.10 INSTRUMENTATION

Damage to plane's attitude, altitude, speed or other dials, HUD, gunsight, navigation and other systems which help the pilot perform his mission. A hit in instrumentation has a 50% chance of affecting ground attack missions, causing an ALM modifier of -1 to -10 (roll randomly).

4.2.11 COMPUTER

Damage to plane's computer systems will typically result in same sort of damage as hits to the instrumentation. In addition, the plane will have to abort mission immediately.

4.2.12 WEAPONS

Damage to the aircraft's machine guns and cannon and their feeding systems results in jams and other problems which render the weapon inoperable. Hits to explosive cannon ammunition will cause considerable damage to the aircraft.

4.2.13 STORES

Damage to aircraft's external or internal bomb racks, rocket pods, fuel tanks. Effect of damage to stores depends on what the plane happens to be carrying at the time. Use appropriate Mechanized Supplement table.

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QDAS-1b: WWII Pilot Proficiency Table:

RAF Position	U.S. Air Force	German Luft-Waffe Early	German Luft-Waffe Late	Pilot Quality	SAL	Error
			1-3	Militia	5	45
1	1		4-6	Green	7	30
2-5	2-5	1-4	7	Line	10	15
6-7	6-7	5-6	8	Crack	11	12
8-9	8-9	7-8		Elite	12	11
10	10	9	9	Elite	13	10
		10	10	Outstanding	14	9

QDAS-1c: WWII Pilot Proficiency Table:

Italian Air Force	Finnish Air Force	Soviet Air Force Early	Soviet Air Force Late	Pilot Quality	SAL	Position Error
1		1-3	1	Militia	5	45
2-3		4-5	2-3	Green	7	30
4-8	1-6	6-8	4-7	Line	10	15
9	7-8	9-10	8	Crack	11	12
10	9		9	Elite	12	11
	10			Elite	13	10
			10	Outstanding	14	9

QDAS-2: FAC Quality Table

FAC Quality	SAL	Position Error

1	Line	10	15
2-4	Crack	11	12
5-6	Elite	12	11
7-8	Elite	13	10
9-10	Outstanding	14	9

Plane speed 450 knots:

Number of bombs	Release interval (s)	Bomb interval (hexes)	Length of target area (hexes)
10	0.05	6	64
10	0.1	13	127
10	0.15	19	181
10	0.2	26	244

To account for changes in aircraft attitude, air pockets, flak, contour of the ground, whatever: For every bomb after the first one roll a d10 to determine exact distance from previous bomb:

1 -3 hexes to interval

2 -2 hexes to interval

3	-1 hex to interval
4-7	0
8	+1 hex to interval
9	+2 hexes to interval
10	+3 hexes to interval

QDAS-3a: GUNSIGHTS

Aim time	1960's Jetfighter	1960's FAC	WWII Fighter
1	-23	-22	-19
2	-12	-12	-11
3	-9	-9	-10
4	-7	-7	-9
5	-6	-6	-8
6	-5	-4	-7
7	-4	-3	-6
8	-3	-2	

9	-2	-1
10	-1	
11	0	

QDAS-3b: BOMBSIGHTS

Aim time	Modern Computer	1960's Computer	WWII Bomber	No Sights
1	-23	-22	-19	-19
2	-12	-12	-11	-11
3	-9	-9	-10	
4	-7	-7	-9	
5	-6	-6		
6	-5	-4		
7	-4	-3		
8	-3	-2		
9	-2	-1		
10	-1			
11	0			

QDAS-5a AIRCRAFT HIT LOCATION TABLE: FRONT

Location	Monoplane	Biplane	Jet
Cockpit	01-03	01-02	
Engine	04-20	03-12	
Lower Fuselage	21-29	13-18	
Fuselage	30-34	19-22	
Tailplane	35-36	23	
Rudder	37	24	
Lower wing, inner	38-73	25-46	
Lower wing, outer	74-00	47-62	
Upper wing, inner		63-84	
Upper wing, outer		85-00	

QDAS-5b AIRCRAFT HIT LOCATION TABLE: FRONT OBLIQUE

Location	Monoplane	Biplane	Jet

Engine	01-23	01-20
Fuselage	24-40	21-35
Cockpit	41-48	36-42
Lower wing, outer	49-61	43-53
Lower wing, inner	62-91	54-79
Upper wing, outer		80-83
Upper wing, inner		84-92
Tailplane	92-94	93-95
Rudder	95-00	96-00

QDAS-5c AIRCRAFT HIT LOCATION TABLE: REAR OBLIQUE

Location	Monoplane	Biplane	Jet
Engine	01-14	01-11	
Cockpit	15-23	12-18	
Lower fuselage	24-31	19-30	
Fuselage	32-45	31-36	
Tailplane	46-55	37-44	
Rudder	56-61	45-48	

Lower wing, inner	62-87	49-69
Lower wing, outer	88-00	70-80
Upper wing, inner		81-89
Upper wing, outer		90-00

QDAS-5d AIRCRAFT HIT LOCATION TABLE: REAR

Location	Monoplane	Biplane	Jet
Engine	01-04	01-03	
Cockpit	05-06	04-05	
Fuselage	07-23	06-18	
Tailplane	24-30	19-23	
Rudder	31-40	24-30	
Lower wing, inner	41-80	31-59	
Lower wing, outer	81-00	60-73	
Upper wing, inner		74-87	
Upper wing, outer		88-00	

6. AIRCRAFT WEAPONS

6.1 BOMBS

Since no stats are available and it is not known how artillery shell data is calculated I'm working on some very rough estimates.

Soviet 50 kg (110 lb) bomb:

Weight 110 lbs (50 kg), slightly less than half of which is explosives.

C	0	1	2	3	4	5	6	8	10	12	15	20	30	40
1.3M	31k	3k	434	115	59	37	26	15	10	7	5	3	1	1

Use Soviet 152mm howizer fragmentation table and Collapse radius.

German SC 50 Grade 1 - Ja, L and Stabo bombs:

Weight 106 lbs (48 kg), 46.3 lb (21 kg) of which is explosives.

C	0	1	2	3	4	5	6	8	10	12	15	20	30	40
1.3M	31k	3k	429	114	59	36	25	15	10	7	5	3	1	1

Use Soviet 152mm howizer fragmentation table and Collapse radius.

German SC50 bomb:

Weight 123 lbs (55.5 kg), 53.8 lb (24.4 kg) of which is explosives.

C 0 1 2 3 4 5 6 8 10 12 15 20 30 40

1.4M 33k 3k 453 120 62 38 27 16 10 8 5 3 1 1

Use Soviet 152mm howizer fragmentation table and Collapse radius.

Soviet 100 kg (220 lb) bomb:

Weight 220 lbs (100 kg), half of which is explosives.

C 0 1 2 3 4 5 6 8 10 12 15 20 30 40

4.6M 110k 11k 1534 407 209 130 91 53 35 26 18 11 5 3

Use US 8 inch howizer fragmentation table and Collapse radius.

British 250 lb bomb, WWII:

Weight ??? lbs (xxx kg), ??? lbs of which is explosives.

C 0 1 2 3 4 5 6 8 10 12 15 20 30 40

xxxk xxxk xxk

250 lb Mk 81 bomb:

Weight xxx lbs (xxx kg), half of which is explosives.

C 0 1 2 3 4 5 6 8 10 12 15 20 30 40

xxxk xxxk xxk

British 500 lb bomb, WWII:

Weight ??? lbs (xxx kg), ??? lbs of which is explosives.

C	0	1	2	3	4	5	6	8	10	12	15	20	30	40
xxxk	xxxk	xxk												

US 500 lb M43 bomb, WWII:

Weight 510 lbs (xxx kg), maybe half of which is explosives.

C	0	1	2	3	4	5	6	8	10	12	15	20	30	40
xxxk	xxxk	xxk												

US 500 lb Mk82 bomb:

Weight 531 lbs (241 kg), 275 lb of which is H-6 high explosive.

C	0	1	2	3	4	5	6	8	10	12	15	20	30	40
9.8M	231k	22k	31h	759	384	237	164	94	64	46	31	20	9	6

Use M-240 mortar fragmentation table and Collapse radius.

German SC250 bomb:

Weight 548 lbs (248 kg), 284 lb (129 kg) of which is explosives.

C	0	1	2	3	4	5	6	8	10	12	15	20	30	40
10.1M	239k	22k	32h	786	398	245	170	98	66	48	32	21	10	6

Use M-240 mortar fragmentation table and Collapse radius.

US 750 lb Mkxx bomb:

Weight xxx lbs (xxx kg), half of which is explosives.

C	0	1	2	3	4	5	6	8	10	12	15	20	30	40
xxxk	xxxk	xxk												

British 1000 lb bomb, WWII:

Weight ??? lbs (xxx kg), ??? lbs of which is explosives.

C	0	1	2	3	4	5	6	8	10	12	15	20	30	40
xxxk	xxxk	xxk												

US 1000 lb M44 bomb, WWII:

Weight 965 lbs (xxx kg), ??? lbs of which is explosives.

C	0	1	2	3	4	5	6	8	10	12	15	20	30	40
xxxk	xxxk	xxk												

US 1000 lb Mk83 bomb:

Weight 985 lbs (xxx kg), 416 lbs of which is explosives.

C	0	1	2	3	4	5	6	8	10	12	15	20	30	40
xxxk	xxxk	xxk												

German SC500 bomb:

Weight c. 1102 lbs (500 kg), perhaps 573 lb (260 kg) of which is explosives.

C	0	1	2	3	4	5	6	8	10	12	15	20	30	40
16.3M	384k	36k	52h	13h	639	395	273	157	106	77	52	34	15	10

Use 16 in shell fragmentation table and Collapse radius.

US Mk84, 2000 lb bomb:

Weight 1972 lbs (xxx kg), 945 lb of which is explosives.

C	0	1	2	3	4	5	6	8	10	12	15	20	30	40
	xxxk	xxxk	xxk											

German SC1000L2 general demolition bomb:

Weight 2209 lb (1002 kg), 1323 lb (600 kg) of which is explosives.

C	0	1	2	3	4	5	6	8	10	12	15	20	30	40
22.1M	520k	49k	70h	17h	866	534	370	213	143	105	70	45	21	14

Use 16 inch shell fragmentation table (but roll twice ??) and Collapse radius.

Makes a 20 meter crater...

Bomb Fall Table:

Altitude (ft)	Time (sec)
10 000	24.5
9 000	23.2
8 000	21.9
7 000	20.4
6 000	18.9
5 000	17.2
4 000	15.3
3 000	13.2
2 000	10.6
1 000	7.4

6.2 ROCKETS

Will be here.

6.3 NAPALM

500 lb napalm container, etc.

6.4 GUNS AND CANNON

German 7.92mm MG 17 machine gun

ROF 10 unsynchronized, 8 synchronized

Ballistic Data

	10	20	40	70	100	200	300	400
FMJ PEN	20	19	17	14	12	7.5	4.6	2.8
DC	8	8	8	7	7	7	6	6
AP PEN	29	27	24	21	18	11	6.6	4.0
DC	8	7	7	7	7	7	6	6
MA	.2	.2	.2	.4	.5	1.0	2.0	2.0
BA	63	56	48	41	36	27	21	17

TOF	0	0	1	2	2	5	7	10

German 20mm MG 151/20 cannon

ROF 6 unsynchronized, KD 20

Ballistic Data

	10	20	40	70	100	200	300	400
AP PEN	112	104	95	82	70	43	26	16
DC	10	10	10	10	10	10	10	10
MA	.2	.2	.2	.4	.5	1.0	2.0	2.0
BA	63	56	48	41	36	27	21	17
TOF	0	0	1	2	2	5	7	10

Ammo types: Explosive/Incendiary, Armor Piercing,
Armor Piercing/Electron Incendiary

Use the following table for 92 gram HE shell:

C	0	1	2	3	4	5	6	7	8	9	10
PEN	2.4	2.3	2.2	1.8	1.5	1.0	1.0	0.4	0.4	0.4	0.4	0.4
DC	10	3	2	2	2	1	1	1	1	1	1	1
BSHC	*2	*1	58	14	6	1	1	-2	-2	-2	-2	-2

BC	712	80	25	8	4	2	2	1	1	1	1	1

Use the following table for 115 gram HE shell:

C	0	1	2	3	4	5	6	7	8	9	10
PEN	2.4	2.3	2.2	1.8	1.5	1.0	1.0	0.4	0.4	0.4	0.4	0.4
DC	10	3	2	2	2	1	1	1	1	1	1	1
BSHC	*2	*1	58	14	6	1	1	-2	-2	-2	-2	-2
BC	890	100	31	10	5	3	3	1	1	1	1	1

Soviet 7.62mm ShKAS machine gun

ROF 15 unsynchronized, estimated 13 synchronized

Ballistic Data

	10	20	40	70	100	200	300	400
m/30 PEN	22	21	19	16	14	8.4	4.8	3.1
DC	8	8	8	8	8	7	7	7
AP PEN	32	30	27	23	20	12	7.3	4.4
DC	8	8	8	8	8	7	7	6
MA	.2	.2	.2	.4	.5	1.0	2.0	2.0
BA	63	56	48	41	36	27	21	17

TOF 0 0 1 2 2 5 7 10

US .50 cal M2 Browning machine gun

ROF 6 unsynchronized

MA .2 .2 .2 .4 .5 1.0 2.0 2.0

Ballistic Data as per M2HB in WWII Weapon Data Supplement

MA = greatest distance bet guns (in yhexes) + guns MA

Speed at deck is 92% of speed at height. Attack speed is 90% of deck speed

Wing area from front: length of one wing x base thickness of one wing

7. PLANES

Messerschmitt Bf 109F-4/Trop

Tropical version

Max speed 624 km/h at altitude, perhaps 574 km/h at deck.

Attack speed 517 km/h, 36 mhex/impulse, 144 mhex/phase

Size: 9.9 m wingspan, length 8.8 m,

height fuselage 1.4 m, whole plane 1.9 m.

Front: Fuselage 0.99x1.5 m. The rest c. 4.29x0.33 m.

1.49+1.42 m^2 = 2.91 m^2

Single shot target size +15 (Hex+3)

1.9 m high, Auto target size +14 (Hex+2)

Side: Fuselage 8.8 m long, 1.4 m high. 12.3 m^2

Single shot target size +20 (Hex+8)

1.9 m high, Auto target size +14 (Hex+2)

Two sychronized MG 17 MG and one unsynchronized 20 mm MG 151 cannon mounted on nose.

Machine guns distance 0.4 meters estimated. Aimed to converge at 400 meters.

ROF 16, Cap 1000

	10	20	40	70	100	200	300	400
MA	0.6	0.6	0.6	0.7	0.8	1.2	2.0	2.4

Cannon aimed with no convergence.

ROF 6, Cap 140

	10	20	40	70	100	200	300	400

MA .2 .2 .2 .4 .5 1.0 2.0 2.0

The F-4/B is identical but may carry a 250 kg bomb beneath fuselage.

Hit Location	Front	FrontObl	RearObl	Rear
Engine				
Inline engine	01-80	01-75	01-45	01-20
Radiator	81-90	76-88	46-65	21-60
Guns	91-95	89-98	66-90	61-95
Graze	96-00	99-00	91-00	96-00
Cockpit				
Instruments	01-25	01-14	01-10	01-03
Pilot	27-59	17-80	17-69	11-59
8mm back armor. The G-14 had 90mm glass armor.				
Fuel tank (+5)	60-00	81-00	70-00	60-00
Lower Fuselage				
Stores	01-50			01-50
Fuel	51-89			51-89
Pilot	90-97			90-97
Graze	98-00			98-00

Fuselage				
Radio	01-10	01-12	01-13	01-10
Graze	11-00	13-00	14-00	11-00
Tailplane				
Control Surfa	01-20	01-30	01-70	01-80
Graze	21-00	31-00	71-00	81-00
Rudder				
Control Surfa	01-50	01-60	01-70	01-80
Graze	51-00	61-00	71-00	81-00
Wing, inner				
Radiator	01-08	01-12	01-16	01-13
Landing Gear	09-59	13-63	17-63	14-50
Hydraulics	60-70	64-74	64-74	51-70
Control Surfa	71-92	75-92	75-92	71-92
Graze	93-00	93-00	93-00	93-00
Wing, outer				
Control Surfa	01-15	01-20	01-25	01-25
Graze	16-00	21-00	26-00	26-00

Polikarpov I-153

Max speed 450 km/h at altitude, perhaps 415 km/h at deck.

Attack speed 374 km/h, 26 mhex/impulse, 104 mhex/phase

Size: 10 m wingspan, length 6 m, 2 m high.

Front: Fuselage 1.4 m diameter. The rest c. 3.21x0.06 m.

1.54+0.19 m^2 = 1.73 m^2

Single shot target size +14 (Hex-1)

2 m high, Auto target size +15 (Hex)

Side: Fuselage 5.8 m long, 1.7 m high. 9.86 m^2

Single shot target size +19 (Hex+4)

1.7 m high, Auto target size +14 (Hex-1)

4 synchronized ShKAS MG mounted on nose and fuselage,

distance c. 1.4 meters. Aimed with no convergence.

ROF 52, Cap 2600

	10	20	40	70	100	200	300	400
MA	1	1	1	1.2	1.3	1.8	2.8	2.8

Note: Very stiff trigger, count as target ducking for first Impulse of every burst.

Up to 200 kg bombs or eight RS-82 rockets under wings on racks, distance 2.4 m from centerline. Typical bomb load was four 50 kg bombs or two 100 kg bombs.

Hit Location	Front	FrontObl	RearObl	Rear
Engine				
Radial engine	01-89	01-73	01-23	01-10
Fuel tank (+5)	90-98	74-96	24-96	11-99
Guns	99-00	97-00	97-00	00
Cockpit				
Instruments	01-25	01-14	01-10	01-03
There is usually no radio.				
Pilot	26-00	15-00	11-00	04-00
8mm back armor. Armored glass for Front angle only, no glass on cockpit sides.				
Lower Fuselage				
Fuel	01-16		01-05	
Pilot	17-30		06-70	
Landing Gear	31-85	13-53	71-90	09-40
Hydraulics	86-95	54-74	91-95	41-70
Graze	96-00		96-00	
Fuselage				
Graze	01-00	01-00	01-00	01-00
Tailplane				

Control Surfa	01-20	01-30	01-70	01-80
Graze	21-00	31-00	71-00	81-00
Rudder				
Control Surfa	01-50	01-60	01-70	01-80
Graze	51-00	61-00	71-00	81-00
Lower Wing, inner				
Graze	01-00	01-00	01-00	01-00
Lower Wing, outer				
Stores	01-15	01-20	01-20	01-15
Graze	16-00	21-00	21-00	16-00
Upper Wing, inner				
Control Surfa	01-15	01-15	01-15	01-15
Graze	16-00	16-00	16-00	16-00
Upper Wing, outer				
Control Surfa	01-15	01-20	01-20	01-15
Graze	16-00	21-00	21-00	16-00

Polikarpov I-16 Type 10

Max speed 465 km/h at altitude, perhaps 428 km/h at deck.

Attack speed 385 km/h, 27 mhex/impulse, 107 mhex/phase

Size: 9 m wingspan, length 6.1 m, height 2.45 m.

Front: Fuselage 1.4 m diameter. The rest c. 3.7x0.12 m.

1.54+0.44 m^2 = 1.98 m^2

Single shot target size +13 (Hex+1)

2.45 m high, Auto target size +16 (Hex+4)

Side: Fuselage 5.6 m long, 1.6 m high. 8.96 m^2

Single shot target size +19 (Hex+7)

1.6 m high, Auto target size +13 (Hex+1)

2 synchronized 7.62mm ShKAS MG mounted on nose

2 unsynchronized 7.62mm ShKAS MG mounted on wings, distance 1.8 meters estimated. Aimed with no convergence.

ROF 56, Cap 2600

	10	20	40	70	100	200	300	400
MA	1.2	1.2	1.2	1.4	1.5	2.0	3.0	3.0

Note: Very stiff trigger, count as target ducking for first Impulse of every burst.

Up to ? kg bombs or four RS-82 rockets under wings on racks, distance 2.6 m from centerline.

Hit Location	Front	FrontObl	RearObl	Rear
Engine				
Radial engine	01-90	01-75	01-25	01-10
Fuel tank (+5)	91-99	76-98	26-98	11-99
Guns	00	99-00	99-00	00
Cockpit				
Instruments	01-25	01-14	01-10	01-03
There is usually no radio.				
Pilot	26-00	15-00	11-00	04-00
8mm back armor. Armored glass for Front angle only,				
no glass on cockpit sides.				
Lower Fuselage				
Fuel	01-16		01-05	
Pilot	17-80		06-80	
Graze	81-00		81-00	
Fuselage				
Graze	01-00	01-00	01-00	01-00
Tailplane				
Control Surfa	01-20	01-30	01-70	01-80
Graze	21-00	31-00	71-00	81-00
Rudder				

Control Surfa	01-50	01-60	01-70	01-80
Graze	51-00	61-00	71-00	81-00
Wing, inner				
Guns	01-08	01-12	01-16	01-08
Landing Gear	09-49	13-53	17-53	09-40
Hydraulics	50-70	54-74	54-74	41-70
Control Surfa	71-85	75-85	75-85	71-85
Graze	86-00	86-00	86-00	86-00
Wing, outer				
Control Surfa	01-15	01-15	01-15	01-20
Stores	16-25	16-25	16-25	21-30
Graze	26-00	26-00	26-00	31-00

Republic P-47D-10 Thunderbolt

Early "Razorback" D-model

Max speed 690 km/h at altitude, perhaps 635 km/h at deck.

Attack speed 571 km/h, 40 mhex/impulse, 159 mhex/phase

Size: 12.4 m wingspan, length 11 m,

height fuselage 2.8 m, whole plane 4 m.

Front: Fuselage 1.27x2.13 m. The rest c. 4.8x0.40 m.

2.71+1.92 m^2 = 4.63 m^2

Single shot target size +16 (Hex+4)

4 m high, Auto target size +20 (Hex+8)

Side: Fuselage 11 m long, 2.5 m high. 27.5 m^2

Single shot target size +23 (Hex+11)

2.8 m high, Auto target size +16 (Hex+4)

8 .50 cal M2 MG mounted on wings, distance 6.3 meters estimated. Aimed to converge at 300 yards.

ROF 48, Cap 2800

	10	20	40	70	100	200	300	400
MA	3.7	3.2	2.8	2.4	2.3	1.0	5.5	7.2

Up to 2500 kg of bombs (typically two 500 lb M43 or 1000 lb bombs) or six 4.5 in M8 rockets in launcher tubes under wings, distance 3.3 m (1.8 yhexes) from centerline. Sometimes 5 inch HVAR rockets were used instead.

Hit Location	Front	FrontObl	RearObl	Rear
Engine				
Radial engine	01-90	01-75	01-25	01-10

Fuel tank (+5)	91-99	76-96	26-96	11-96
Hydraulics	00	97-00	97-00	09-00
Cockpit				
Instruments	01-25	01-14	01-10	01-03
Radio	26	15-16	11-16	04-10
Pilot	27-69	17-80	17-69	11-69
Back armor.				
Fuel tank (+5)	70-00	81-00	70-00	70-00
Lower Fuselage				
Stores	01-33			01-33
Fuel	34-39			34-45
Pilot	40-60			46-50
Supercharger	61-93			51-93
Graze	94-00			94-00
Fuselage				
Supercharger	01-80	01-60	01-70	01-80
Graze	81-00	61-00	71-00	81-00
Tailplane				
Control Surfa	01-20	01-30	01-70	01-80
Graze	21-00	31-00	71-00	81-00
Rudder				

Control Surfa	01-50	01-60	01-70	01-80
Graze	51-00	61-00	71-00	81-00
Wing, inner				
Guns	01-08	01-12	01-16	01-08
Landing Gear	09-49	13-53	17-53	09-40
Hydraulics	50-70	54-74	54-74	41-70
Control Surfa	71-92	75-92	75-92	71-92
Graze	93-00	93-00	93-00	93-00
Wing, outer				
Control Surfa	01-15	01-15	01-15	01-20
Stores	16-25	16-25	16-25	21-30
Guns	26-60	26-60	26-60	31-65
Graze	61-00	61-00	61-00	66-00

Send Comments

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PHOENIX COMMAND

Appendix

7.2 APPENDIX: MORE NOTES ON PLANES

A-1 Skyraider

Cessna A-37B Dragonfly

1 7.62 mm GAU-2B/A minigun in nose

8 wing pylons, max load 2576 kg

- 4 inner 394 kg
- 2 intermediate 272 kg
- 2 outer 227 kg

Grumman A-6 Intruder

5 pylons each 1633 kg, max load 6804 kg

Typical load 30 227 kg bombs

Other possible loads:

- Anti Radiation: Four HARM, One Drop Tank, Range 1530nm.
- Anti Surface - guided bombs: Four Walleye II, One Drop Tank, Range 1530nm.
- Anti Surface - Cluster Bombs: Twenty Two Mk20 Rockeye, One Drop Tank, Range 1530nm.
- Anti Surface - 500lb Free Fall Bombs: Eight Mk82 500lb bomb, One Drop Tank, Range 1530nm.
- Anti Surface - 2000lb Free Fall Bombs: Five Mk84 2000lb bomb, Range 1440nm.

McDonnell Douglas A-4E Skyhawk

2 20 mm Mk 12 cannon, each w. 200 rounds

5 pylons for max load of 3720 kg

- usually carries fuel on two pylons
- typically 10 250 lb bombs or 4 500 lb napalm or 1 pods of 19 2.75 in rockets

McDonnell Douglas F-4D Phantom (Navy)

5 pylons for up to 7257 kg

- can carry 1 20 mm M-61 multi-barrel cannon in a pod
- usually carries fuel on two pylons

McDonnell Douglas F-4E Phantom (Air Force) 1967-

1 20 mm M-61 multi-barrel cannon

5 pylons for up to 7257 kg

- usually carries fuel on two pylons

Republic F-105F Thunderchief

1 20 mm M-61 Vulcan gun w. 1029 rounds. 6600 rpm.

Internal bay for 3629 kg

3 external pylons for 2722 kg

Some typical loads:

- Six 750 lb bombs on centerline, extra fuel tanks on wing pylons.

Northrop F-5A Freedom Fighter

2 20 mm M-39A2 cannon each w. 280 rounds

5 pylons for 2000 kg

Vought A-7B Corsair II (Navy) 1967-

2 20 mm Colt Mk 12 gun

8 pylons for max load of 6804 kg, but usually carries fuel on 2

Vought A-7D Corsair II (Air Force)

1 20 mm M-61 gun w. 1000 rounds

8 pylons for max load of 9072 kg, but usually carries fuel on 2

Vought F-8E Crusader (Navy)

4 20 mm guns

4 pylons for 12 Mk 81 bombs

Spitfire

Max speed:

Attack speed: km/h hex/imp, mhex/impulse

Head-on Target Size:

Oblique Target Size:

Side Target Size:

Engine: Inline

Armor: Pilot back armor

Mark I to VA (1939-41):

8 .303 cal Browning MG with 350 rounds and max range of 1000 yards. 1000 rpm.

Aimed to meet (apex of convergence) 250 yards in front of the plane's nose, then spread out again.

Mark VB:

Four .303 cal Browning MG with 350 rounds per gun.

Two 20mm Hispano cannon. 600 rpm.

Spit VB early: 60 rnd drum, VB late onwards 120 rnd belt

Two 250 lb bombs or one 500 lb.

Mark IX to at least Mark XIV: 2 .50 cal Browning with 250 rnds,

2 20mm Hispano Mk II cannon with 120 rounds. 600 rpm.

Two 250 lb and one 500 lb bomb.

Mark F21 and later marks: 4 Hispano cannon, outboard with 150 rounds, inboard with 175 rounds per gun.

Two 250 lb and one 500 lb bomb.

For ground-attack missions planes were fitted with tracer, explosive and armor-piercing shells and bullets.

Notes: Used in the 1948 A

Hawker Hurricane

Mark I:

8 .303 cal Browning MG with 300 rounds and max range of 1000 yards. 1000 rpm.

Aimed to meet (apex of convergence) 250 yards in front of the plane's nose.

Mark II:

Some Russian models had only two 20 mm cannon and two 12.7mm Berezina MGs.

Me-109

Bf-109E:

Two 20 mm cannon, two 7.92 mm MG

Curtiss P-40 Warhawk,

P-40C:

P-40E, P-40K: Six 50 cal MGs often ranged to 287 yards with 315 rounds per gun.

All types: 500 lb of bombs, often one 500 lb or six 18 lb fragmentation bombs

North American P-51 Mustang

P-51D: Also used napalm in the Korean War.

A-10 Thunderbolt II

One 30 mm GAU-8/A Avenger cannon

B-52

66 340 kg bombs in bomb bay + 24 more on pylons on wings

OR 84 225 kg bombs in bomb bay + 24 340 kg bombs on pylons on wings

B-52 bombers will lay a carpet of 1000 lb bombs 1 km wide, 3 km long

A-26B Invader

Called the B-26 in Korea

Hard nose with eight 50 cal MGs.

Standard load for typical night intruder mission in Korea was four 500 lb bombs under wings and fourteen 250 lb fragmentation cluster bombs in the bomb bay.

Todo: Me-262, P-47, P-38, FW-190, Typhoon, Tempest, B-25,

9. WEAPON TO DO LIST:

.303 cal Browning MG: max range of 1000 yards. 1000-1200 rpm, 2660 fps.

7.62 mm GAU-2B/A minigun

7.92 mm Solothurn MG 17. 1100 rpm, 3000 fps.

.50 cal Browning M2. 750 rpm, 2850 fps.

12.7mm Berezina MG

13 mm Rheinmetall Borsig MG 131 MG. 930 rpm, 2560 fps - 750 mps.

20 mm MG FF. 540 rpm, 1920 fps.

20 mm Hispano cannon. 600 rpm.

20 mm Hispano Mk II cannon. 600 rpm, 2850 fps.

20 mm Mk 12 Colt cannon

20 mm M-3 cannon

20 mm M-61 Vulcan multi-barrel cannon. 6600 rpm (ROF 58)

20 mm M-39A2 cannon

30 mm Rheinmetall Borsig MK 103 cannon. 420 rpm, 2820 fps. HE shells. Effective range 2000 ft.

30 mm Rheinmetall Borsig MK 108 cannon. Jams about 1/100 rounds fired ! 660 rpm, 1700 fps. 11-ounce mine/tracer or incendiary shells. Effective range 1300 ft.

30 mm GAU-8/A Avenger cannon

2.75 in rockets

US 4.5 in M8 rockets, WWII. 860 fps. Difficult to aim, a delay between firing and acceleration. Installed in racks of three per wing on the P-47D.

US 5-inch rocket, WWII. 860 fps. Modified AA shell stuck on 3.5-inch rocket motor. "Does about half as much damage as a 500 lb bomb"

UK 5-inch rocket, WWII. 860 fps. "Does about half as much damage as a 500 lb bomb"

R4M rockets for air-to-air. Weight 4 kg, thin walled shell. Firing time 0.3 seconds for 24 rockets. From 1800 feet scatter to cover area of one bomber.

Wfr. Gr. 21 Rocket-fired mortar. 210mm rocket. 1030 fps, range 3280 ft, vertical deviation 25 ft, horizontal 130 ft. 80 lb warhead.

US CRV7 rocket. Used in the LAU 5003A rocket pod.

==========

Quick and Dirty Tactical Air Support Rules

Version 0.2, May 2000

10.0 EXAMPLES

Here are a few examples of how these rules could be used in a PCCS game session.

10.1 WWII ROCKETING

On a dazzling February 1940 day Russian fighters are doing their daily strafing runs at the Finnish positions at Kollaa River. Spotting what seems to be a log bunker on a hill mowed bare by artillery, the lead Polikarpov I-16 waggles his wings to signal attack (the fighters have no radios) and dives in for the kill. The fighter pilot is a Line quality pilot and has 4 CA.

At this moment the Russian fighter is 1 km (500 mhexes) east of the bunker and closing in at a rate of 27 mhexes per Impulse, or 108 mhexes per Phase. 50 mhexes south of the bunker, a Line quality Finn notices the planes and decides to attempt to engage them with his L/S 26 LMG.

Phase I: The Russian closes to 392 mhexes of the MG position and aims for 4 CA as the Finn takes up firing position (2 CA) and aims for 2 CA.

Phase II impulse 1: At a range of 378 mhexes, the Finn opens fire:

```
                    Value     ALM
```

```
     SAL:              10       10

     AimTime:           2      -17 (though aimed for 3 CA, max Aim Time
is )

     Range            378      -10

     Standing:                   0

     Aiming:                     0

     Target Size:      16       16

     Good Visibility             0

     Moving Table 4D   -5       -5 (Maximum Aim 2 Impulses)

     Air target       -10      -10

     ------------------------------

     Total                     -16  => 1% chance to hit
```

He misses and decides to aim for 3 CA more. At the end of the Phase the plane has closed to 284 mhexes and his chances of hitting remain similar:

```
                     Value    ALM

     SAL:              10       10

     AimTime:           2      -17 (though aimed for 3 CA)

     Range            284       -8

     Standing:                   0

     Aiming:                     0

     Target Size:      16       16

     Good Visibility             0
```

Moving Table 4D	-5	-5	(Maximum Aim 2 Impulses)
Air target	-10	-10	
Total		-14	=> 2% chance to hit

Phase III: The Finn continues to aim, waiting for the plane to come closer.He fires on the last Impulse when the plane is only 190 mhexes away.

	Value	ALM	
SAL:	10	10	
AimTime:	2	-17	(though aimed for more)
Range	190	-5	
Standing:		0	
Aiming:		0	
Target Size:	16	16	
Good Visibility		0	
Moving Table 4D	-8	-8	(Maximum Aim 2 Impulses)
Air target	-10	-10	
Total		-	=> 2% chance to hit

The Finn again misses by a mile.

Phase IV: The Finn decides to wait until the plane is closer. He aims for 2impulses, while the

plane closes to 136 hexes from the bunker.

```
                      Value    ALM

     SAL:              10       10

     AimTime:           1      -27 (max aim for Oblique target)

     Range            136       -3

     Standing:                   0

     Aiming:                     0

     Target Size:      13       13 (more than 30 degrees, use Oblique
target

size)

     Good Visibility             0

     Moving Table 4D -10      -10 (Maximum Aim 2 Impulses)

     Air target      -10      -10

     -----------------------------

     Total                    -    => 0% chance to hit
```

The plane is speeding past far too quickly for the Finn to have any chance of hitting it ! In the cockpit, the Russian pilot has now been aiming at the bunker for 14CA... he flicks some switches, firing the four RS-82 rockets under his wings... they roar away towards the target at a speed of 158 hexes per Phase.

The Finn waits until the end of the Phase but he cannot get the plane in his sights...

```
                      Value    ALM
```

```
     SAL:              10       10

     AimTime:           1      -27 (max aim for Oblique target)

     Range             82        1

     Standing:                    0

     Aiming:                      0

     Target Size:      13       13 (more than 60 degrees, use Oblique
target

size)

     Good Visibility              0

     Moving Table 4D  -10      -10 (Maximum Aim 2 Impulses)

     Air target       -10      -10

     ------------------------------

     Total                      -    => 0% chance to hit
```

PHASE V: The rockets strike the target area at the end of Impulse 1:

```
                      Value   ALM

     Pilot skill SAL   10      10

     AimTime            7      -6 (max for WWII fighter)

     Range             136

     Moving Table 4D    27     -10 (but may Aim for more than 2 Impulses
worth)

     Target is  A Hex           15 (an "Elevated" hex)
```

```
Good Visibility            0

-----------------------------

Total                    + 9  =>  9%
```

9% chance to actually aim at the target hex with the salvo. The bunker is 2x2 hexes so the actual likelihood of hitting it is somewhat larger. The Russian rolls a 31 for the aiming point so it is incorrect. The EAL difference is 9 so lengthwise the aiming point is off by two hexes, long. Left-Right Position Error = 18 - SAL - d10 (rolls 5) so the aiming point also is three hexes towards the right. This is the actual aiming point of the salvo.

The player now rolls for the four rockets. The Left-Right Position Error is 10 - d10:

Rocket#	d10	LocError	Direction
1	6	4 hexes	NW of actual aiming point
2	8	2	NE of rocket #1
3	3	7	SW of rocket #2
4	9	1	NW of rocket #3

All the rockets miss, the closest landing some twelve meters from the bunker.

The Finn waits until the plane is almost on top of the bunker:

```
                  Value    ALM

SAL:               10       10

AimTime:            1      -27 (max aim for Oblique target)

Range              60        3 (28 hexes from the bunker)

Standing:                    0

Aiming:                      0
```

```
     Target Size:     13       13 (more than 60 degrees, use Oblique
target

size)

     Good Visibility            0

     Moving Table 4D -10      -10 (Maximum Aim 2 Impulses)

     Air target      -10      -10

     ------------------------------

     Total                    -    => 0% chance to hit
```

At the end of the Phase the Polikarpov is 26 hexes past the bunker and climbing away. The Finn LMG gunner has not suceeded in hitting the plane with a single round. He can still continue to engage the plane as it recedes into the distance.

10.2 WWII STRAFING AND BOMBING

Swooping low over Western Desert in his Bf-109F/Trop, Hauptmann Erich Juhola notices a small British convoy of three wheeled vehicles. He barks an order and the staffel wheels into attack...

Note for modellers: The square rivets of Hauptmann Juhola's Bf-109F/Trop indicate that it is of the batch made in Dusseldorf in the brown-roofed assembly building by Rumanian slave labor. Bf-109F/Trop batches made in the red-topped building by Hungarian slave labor had round rivets. The plane is finished in Leichtes Dunkelhell Braun #85 (Humbrol 203) with spots of Schweres Dunkeldunkel Braun #82 (Humbrol 221). Hauptmann Juhola was credited with a total of three kills - two Junkers 88's (well they do look a bit like Blenheims) and one barrage balloon - this last kill being awarded posthumously.

Due to his ineptitude Hauptmann Juhola is considered a Green pilot with 3 CA. The other pilots and the Brits in the convoy are Line with 4 CA.

PHASES I-VII:

The Hauptmann's Messerschmitt is three kilometers (1500 mhex) away when he banks sharply,

beginning his attack run. The plane's Attack speed is 517 km/h (323 mph), 36 mhex/impulse, 144 mhex/phase... He lines up his sights for a frontal attack on the lead vehicle which turns out to be a Jeep. The rest of the vehicles are trucks. The vehicles are travelling in a column with 50 meters, 25 mhexes, between each other.

In the Jeep, an intrepid British machine gunner spots the attacking fighters coming in from the ... He yells a warning to his mates and prepares his Lend-Lease, AA-mounted M1919 A4 30-caliber MG for action. The wheeled vehicles are travelling at 25 km/h i.e. 16 mph, 7 mhexes per Phase. The combined speed of the plane and the vehicles is thus 151 mhexes per Phase, 38 mhexes per Impulse.

PHASE VIII:

At the beginning of the Phase the leading fighter plane is now 443 mhexes from the Jeep. On Impulse 3 the Brit gunner opens fire, at range 368 mhexes... The plane is coming directly at the Jeep and thus the Front target size is used.

	Value	ALM	
SAL:	10	10	
AimTime:	3	-21	(max aim for AA mounted weapon)
Range	368	-10	
Standing:		0	
Aiming:		0	
Target Size:	14	14	
Good Visibility		0	
Moving Table 4D	-8	-8	(Maximum Aim 2 Impulses overridden by AA mount)
Air target	-10	-10	
Total		-25	=> 0% chance to hit

The Hauptmann has been aiming all along at the Jeep and now opens fire. The Jeep is 335 cm

long, 132 cm high and 230 cm wide - the GM assumes this makes for a target which is 30% of the vehicle's length + its height high, and as wide as the vehicle... that is to say 233 cm "high" and 230 cm wide, i.e. size 17:

```
                    Value    ALM

     SAL:             7        7

     AimTime:         7      - 6 (max aim for WWII plane)

     Range          368      -10

     Target Size:    17       17

     Good Visibility           0

     Moving Table 4D  -8       -8 (Maximum Aim 2 Impulses overridden by
WWII plane)

     Ground target    0        0

     ------------------------------

     Total                     0  => 10% chance to hit,
```

Rolls a 79 so the burst goes 20 hexes long... Left-Right Position Error = 16 - SAL (7) - d10 (rolls 1) = 8 hexes towards the left... quite close to the first truck, actually, so the Hauptmann decides to hose that vehicle first. On Impulse 4 the distance has closed to 330 hexes and the chance of hitting rises to 11%, in addition the GM gives him an additional +1 ALM for tracking the fire. But the player rolls 72 and the burst goes short.

PHASE IX:

At the beginning of the Phase the Bf-109 is 292 mhexes away from Jeep, 318 from the truck. GM now gives the German player a +2 ALM for tracking fire for two Impulses... the bullets and shells again go wide...

On Impulse 2, the Brit gunner has aimed all he can and blasts away at the fighter plane which is now only 254 hexes away:

```
                    Value    ALM
```

```
     SAL:              10       10

     AimTime:           3      -21 (max aim for AA mounted weapon)

     Range            254       -8

     Standing:                   0

     Aiming:                     0

     Target Size:      14       14

     Good Visibility             0

     Moving Table 4D   -9       -9 (Maximum Aim 2 Impulses overridden by
AA mount)

     Air target       -10      -10

     ------------------------------

     Total                     -24  => 0% chance to hit
```

The Hauptmann is now only 280 hexes from his target truck but has no CA available until Impulse 3 when he is 242 hexes away... he probably continues firing, the bullets throwing dust in the air near the truck... on Impulse 3 he fires again but with no bonus for tracking fire as he had no CA to do so:

```
                     Value    ALM

     SAL:              7        7

     AimTime:          7      - 6

     Range            242      - 7

     Target Size:      17       17

     Good Visibility             0
```

```
     Moving Table 4D - 9      - 9 (Maximum Aim 2 Impulses overridden by
WWII plane)

     Ground target     0        0

     -----------------------------

     Total                      2  => 13% chance to hit,
```

Rolls an 11 so he hits the truck... using a ROF of *16 for MG and *6 for cannon and a target 270 cm (106 in) wide, we get 9 hits by machinegun and six by cannon... the rounds tear through the truck...

On Impulse 4 the Hauptmann continues wreaking destruction on the hapless truck. Now the distance is 204 hexes and

```
                     Value    ALM

     SAL:              7        7

     AimTime:          7      - 6

     Range           204      - 6

     Target Size:     17       17

     Good Visibility            0

     Moving Table 4D - 9      - 9 (Maximum Aim 2 Impulses overridden by
WWII plane)

     Ground target     0        0

     Tracking          1        1

     -----------------------------

     Total                      4  => 17% chance to hit but the burst
goes wide.
```

PHASE X:

At the beginning of the Phase the fighter is 166 hexes away from the truck...

	Value	ALM	
SAL:	7	7	
AimTime:	7	- 6	
Range	166	- 4	
Target Size:	17	17	
Good Visibility		0	
Moving Table 4D	-10	-10	(Maximum Aim 2 Impulses overridden by WWII plane)
Ground target	0	0	
Tracking	2	2	
Total		6	=> 21% chance to hit,misses again...

The Brit gunner has again aimed all he can and blasts away:

	Value	ALM	
SAL:	10	10	
AimTime:	3	-16	(max aim for AA mounted weapon)
Range	141	-3	

```
     Standing:                  0

     Aiming:                    0

     Target Size:     14        14

     Good Visibility             0

     Moving Table 4D -10       -10 (Maximum Aim 2 Impulses overridden by
AA mount)

     Air target      -10       -10

     ------------------------------

     Total                     -15  => 2% chance to hit
```

Impulse 2: The Hauptmann has no CA, the brit gunner continues to fire, now at distance 128 hexes but with SAB 1 from recoil...

```
                    Value    ALM

     SAL:            10        10

     AimTime:         3       -16 (max aim for AA mounted weapon)

     Range           103        -1

     Standing:                  0

     Aiming:                    0

     Target Size:     14        14

     Good Visibility             0

     Moving Table 4D -10       -10 (Maximum Aim 2 Impulses overridden by
AA mount)
```

```
     Air target       -10      -10

     SAB                1      - 1

     ------------------------------

     Total                      -14  => 2% chance to hit
```

Impulse 3, the Hauptmann fires yet again at the first truck, at a range of only 90 hexes...

```
                     Value    ALM

     SAL:              7        7

     AimTime:          7      - 6

     Range            90        0

     Target Size:     17       17

     Good Visibility            0

     Moving Table 4D -10      -10 (Maximum Aim 2 Impulses overridden by
WWII plane)

     Ground target     0        0

     Tracking          0        0

     ------------------------------

     Total                      8  => 27% chance to hit,
```

Hits, this time with 12 MG rounds and six cannon shells. The Brit gunner attempts to retaliate

```
                     Value    ALM

     SAL:             10       10
```

```
     AimTime:          3      -16 (max aim for AA mounted weapon)

     Range            65        3

     Standing:                   0

     Aiming:                     0

     Target Size:     14       14

     Good Visibility             0

     Moving Table 4D -10      -10 (Maximum Aim 2 Impulses overridden by
AA mount)

     Air target      -10      -10

     SAB               2      - 2

     ------------------------------

     Total                    -11  => 2% chance to hit
```

Impulse 4... the Hauptmann switches targets to truck #2, range now only 77 hexes, aiming . The Brit gunner objects to this furiously:

```
                    Value    ALM

     SAL:            10       10

     AimTime:         3      -16 (max aim for AA mounted weapon)

     Range           27        9

     Standing:                 0

     Aiming:                   0

     Target Size:    14       14
```

```
     Good Visibility            0

     Moving Table 4D -10       -10 (Maximum Aim 2 Impulses overridden by
AA mount)

     Air target      -10       -10

     SAB               3       - 3

     -----------------------------

     Total                     - 6  => 5% chance to hit,
```

By a miracle he hits the plane ! Four bullets, i.e. the entire burst hit the Hauptmann's Messerschmitt, the player rolls 72, 66, 49, 33 for locations, resulting in three hits to right Inner Wing and one to Fuselage. The player rolls 11, 25, 53 so all three wing hits damage the landing gear, the fuselage hit is a graze only. None of these hits are serious and the Hauptmann does not suffer a Morale effect from them. The fighter roars over the Jeep, continuing towards the trucks.

PHASE XI:

The Hauptmann is now only 39 hexes from the second truck. Because on Impulse 2 he will not have any CA to expend he cannot continue engaging the truck on this Impulse (he would end up 1 hex away from the truck, nose pointing right at it and then crash into it on Impulse 2). If he had CA for Impulse 2 he could pull up just in time and skim over the canvas top of the truck, hoping the vehicle wasn't going to blow up just then... Hauptmann Juhola curses and pulls up, banking away. He has expended 96 MG and 36 cannon rounds and received negligible damage. He can afford to come around again.

About 50 hexes behind him comes the second fighter of the Staffel. This pilot has elected to bomb the first truck. He has been aiming for 2 CA, the maximum for a plane with no bomb sight, at a hex right in front of the truck,

```
                    Value    ALM

     SAL:             10       10

     AimTime:          2      -11 (No bomb sight)

     Range            77        1
```

```
Target Size:     15       15 (Elevated Hex)

Good Visibility            0

Moving Table 4D -10      -10 (Maximum Aim 2 Impulses)

Ground target     0        0

------------------------------

Total                      5  =>  4% chance to hit,
```

Rolls 70 so misses by 17 hexes, the bomb goes long and Left-Right Position Error = 22 - SAL (which is 10) - d10 (rolls 1) = 11 hexes to the left of where he aimed. Even from such a distance the bomb is likely to cause damage to the occupants of the truck. The Messerchmitt banks away, its Daimler-Benz engine howling angrily.

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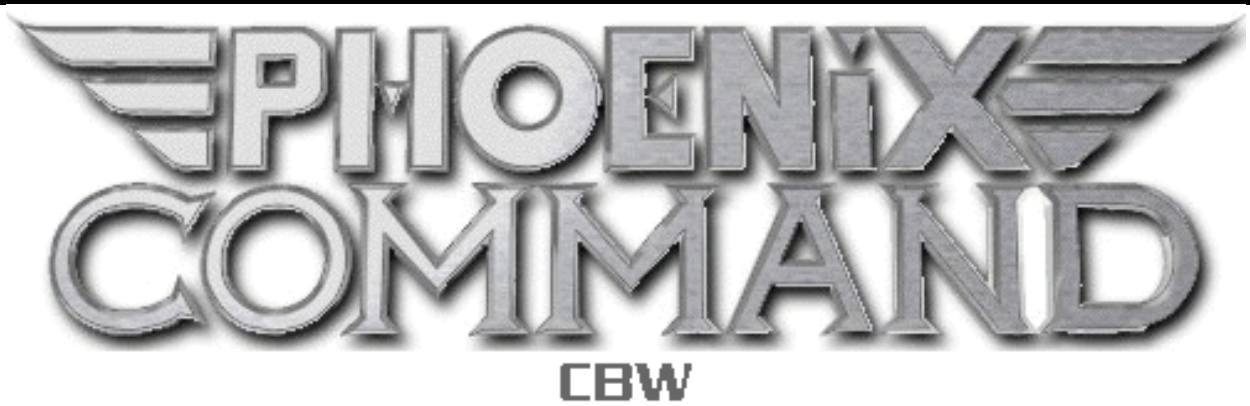

Chemical and Biological Warfare
Phoenix Command Weapon Systems Data Supplement

INTRODUCTION

The Chemical and Biological Warfare supplement for the Phoenix Command Combat System examines chemical and biological warfare agents able to be dispersed as gases, aerosols, or vapors and allows these agents to be incorporated into simulations of modern warfare. All known CBW agents likely to be stockpiled are detailed.

"Armis Bella Non Venenis Geri"
-(War is waged with weapons, not with poisons) -- Ancient Roman condemnation of well poisoning.

This rules set was originally designed in 1990, but never saw print. The rules are presented here for the first time.

Links:

Chapter 1: Dispersal and Protection
Chapter 2: Chemical Agents
Chapter 3: Biological Agents
Delivery Systems Effects Tables
Chemical Agent Effects Tables

Background:The Application of CBW

Chemical warfare in its modern form was first practiced on the trenches of Ypres in World War I, but the use of poisons to strike at the enemy has been employed since ancient times. The development of Chemical and Biological Warfare (CBW) before Ypres, however, remained relatively unchanged from the days of the well poisoners.

Early Uses:

It was a detested practice among ancient Greek and Roman armies to throw poisons, corpses, or other contaminants down wells to deny enemy use of them. However, well poisoning effectively destroyed the well and did not limit its attack to only enemy troops. Despite public condemnation, the tactic survived to the middle ages.
Another CBW tactic which saw wide use in the medieval period was the catapulting of diseased corpses into besieged fortresses. The disease would soon spread among the defenders and weaken them sufficiently for conventional forces to take the fortress. The Mongols, in their siege of the Crimean city of Kaffa in A.D. 1346, catapulted their own plague-

ridden corpses over the city walls. The refugees from Kaffa travelled to Constantinople, Genoa, and Venice, and they carried the plague with them--possibly contributing to the Black Death outbreak three years later.

The earliest use of CBW as the sole weapon in a conflict was the attempted genocide of the Ohio Indians by the British governor Lord Amherst. Following an Indian rebellion in 1763, Amherst ordered two blankets and a hankerchief from a smallpox hospital to be sent as gifts to the Ohio tribe. Within a few months, a terrible smallpox epidemic had broken out and ravaged the tribe.

Modern Era:

While the early efforts in CBW relied almost exclusively on disease to weaken the enemy over a relatively long period of time, the rise of the European chemical industries meant that enemy troops could be incapacitated by new, fast-acting poisons dispersed as gases or aerosols. The entire focus of CBW shifted to the use of chemical agents.

By the late ninteenth century, the entire concept of CBW was viewed almost dilletantishly by the Europeans. No army had incorporated a "gas" or "chemical" force, and CBW was used haphazardly, when it was used at all. The British had authorized the use of noxious sulphur fumes in the siege of Sebastopol during the Crimean war, and they had fired experimental shells containing picric acid at the Boers during the second Anglo-Boer War. The French had developed tear gas projectors and grenades for riot control during this time.

Despite these developments, the various European armies looked down on CBW as being immoral and unchivalrous, an attitude that led to the 1899 Hague convention, Article 23, which supposedly banned all projectiles whose sole purpose was the diffusion of asphyxiating or deleterious gases.

In World War I, Article 23 was shown to be worthless. Fritz Haber, head of the German Chemical Warfare Service, convinced the German Imperial Army to try his gas weapons as a means of breaking through the Allied front lines. The test was performed at Ypres, on April 22, 1915, when German pioneers uncapped bottles of Chlorine gas, and allowed the wind to carry the green chemical cloud across the Allied troops stationed there. The initial shock of the gas attack was not exploited by the German command, and the front lines remained unchanged.

What had changed was the attitude of the belligerents toward CBW. The attitudes that had brought about the Hague convention had been thrown aside at Ypres as the Allies set about working on gas defence and gas offence. The following years of the war saw the introduction of new delivery and protection systems and gases, like phosgene, chlorpicrin, and mustard gas.

While the armies and politicians seemed to adopt chemical weapons, the general public viewed them with revulsion. Chemical weapons were the first true weapons of indiscriminate and mass destruction, and the public saw their effects firsthand when the casualties returned home. This attitude did not stop the various governments involved from embarking on chemical weapons programs after the war. These programs continued despite the 1925 Geneva convention which was supposed to ban the use of such weapons. In World War II, chemical and biological weapons were not used. However, both Axis and Allied powers experimented with and developed chemical and biological agents.

In an arms race overshadowed by that of nuclear arms, chemical and biological weapons were developed and stockpiled at a tremendous rate by the U.S. and the Soviet Union during 1950-70. In spite of the arms race, CBW was used only in the background in the brushfire wars of the period. North Korea alleged that the U.S. was using BW during the Korean war. Egypt was accused of using Soviet nerve agents against royalist troops in its 1963-67 intervention in Yemen. The U.S. used riot gases and defoliants during its war in Vietnam.

In 1975, reports of chemical warfare began filtering out of Laos and Afghanistan. The Hmong tribespeople of Laos claimed that they had been attacked by CBW agents released through aerial spraying. The chemical agent was dubbed "Yellow Rain," but debate still rages as to whether it actually existed. In Afghanistan, Soviet troops were accused of using lethal and

incapacitating chemical agents against the Mujihaddeen. These reports remain unconfirmed as of this writing. Still, it was Yellow Rain that encouraged the U.S. to resume production of chemical weapons in the 1980s.

During the Iran-Iraq war of 1980-89, Iraq used chemical weapons against Iranian troops as early as 1982, and continued to use them throughout the war. The chemical agents used were mustard gas, tabun, and lewisite. In 1984, U.N. observers confirmed the Iraqi use of mustard gas. Later on in the war, Iraq launched lethal agents against Kurdish villages within its own borders to deal with Kurdish guerrillas supported by Iran.

The Iran-Iraq war marks the beginning of a disturbing trend of non-superpower acquisition of lethal chemical and biological agents. More and more nations are turning to CBW as proxies for the tightly regulated nuclear weapons.

There have also been cases of terrorist groups attempting to obtain commercial CBW agents or developing their own in makeshift labs. In November 1980, a raid on a Paris safehouse of the West German Red Army Faction uncovered a bathroom lab containing botulin, and in 1984, two Canadians using false credentials ordered tetanus and botulism cultures from a Maryland research firm. These incidents show the potential for terrorist use of chemical and biological warfare against their targets.

> ***Author's Note:*** *This was written before the Japanese Subway attack where terrorists used Sarin nerve gas dispersed into the Tokyo subway system to sow terror throughout Japan.*

Future wars are likely to see greater use of chemical and biological weapons, and not only against military forces.

Send comments.

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Chemical and Biological Warfare
Phoenix Command Weapon Systems Data Supplement

DISPERSAL AND PROTECTION

Chemical and biological weaponry is an aspect of warfare which is increasing in importance on the modern battlefield. From the recent use of chemical agents in the Iran-Iraq war to allegations of "Yellow Rain" in Laos, potential military use of lethal chemical and biological weapons is almost certain in a future conflict. Non-lethal agents, such as riot gases, are used daily by various governments and police forces to control civil unrest. Also, various terrorist groups have attempted to manufacture or otherwise obtain biological agents and toxins, meaning that CBW agents may be employed in any setting.

This chapter is concerned with providing background on chemical weapons. Rules are included for military and terrorist delivery systems, as well as special riot control delivery systems. Rules are also provided on decontamination procedures and CBW protective equipment.

It should be noted that while the delivery systems described herein can be used by both chemical and biological agents, chemical agents are the primary payloads. Biological weapons have special dispersal effects which are detailed in Chapter 3, so the dispersal effects covered in this Chapter relate primarily to chemical agents.

Dispersal Methods: Groundbursts

This section covers rules for the dispersal of CBW agents through groundburst explosions. The groundbursts can be created by burst-type grenades, artillery shells, artillery rockets, aircraft bombs, or ground-based explosives like car bombs.

The following rules deal specifically with artillery-delivered gas rounds. More detailed rules on other dispersal methods are in development and will be posted when ready.

NON-PERSISTENT AGENTS:

When a groundburst CBW weapon detonates, the explosive charge hurls the CBW agent a distance from the point of explosion. Within this burst radius, the agent mixes with the atmosphere in a specific ratio, called the Concentration (CNC).

The CNC is shown on the Delivery Systems Effects Tables for the particular delivery system being used.

As time passes, the agent dissipates and the CNC drops. The drop in CNC can be found on the Delivery Systems Effects Table by indexing the delivery system with the elapsed time since the explosion and moving down the table by the number of rows indicated. Elapsed time is always read from the "Non-Pers." column.

> ***Example:*** *A 155mm artillery shell lands two hexes away and explodes, throwing out AC gas, a non-persistent chemical agent. By indexing the 155mm howitzer on the Delivery Systems Effects Table with the "5p", or "5 phase" row, the CNC at is found to be 10. This means that for phases 1-5 after explosion, the CNC at range 2 hexes is 10. For phases 6-10 after explosion, the CNC is equal to 9, and so on until the end of phase 20, when the CNC drops to 7.*

WIND EFFECTS:

When wind is present, the non-persistent agent does not simply form a cloud, but instead moves downwind. Use a marker to track the movement of the impact centre of the cloud, and measure all effects from there.

The movement of the wind will force the non-persistent cloud to mix with more air, thus lowering the CNC. To find the CNC downwind of the Burst Zone, index the wind speed in hexes per phase (2 x HPP = mph) with the Delivery System. The non-persistent cloud is generated at the point of impact of the burst and moves downwind at the wind speed.

Targets in the course of the cloud from 0 to Wind Speed (W) hexes are attacked at a CNC found on the Delivery Systems Effects Table by indexing the wind speed in HPP with the delivery system. Targets in the course of the cloud from W to 2 x W hexes are attacked at a CNC found one line down, and the section from 2 x W to 3 x W has a value found two lines down, and so forth.

> ***Example:*** *Taking the artillery shell in the previous example and assuming that a 10 HPP wind is blowing, the impact centre of the cloud will have a CNC of 10 as it moves downwind to 10 Hexes. As it moves from 11 to 20 hexes downwind, it has a CNC of 8, and so forth.*

PERSISTENT AGENTS:

Persistent agents are much denser in nature than non-persistent agents and they tend to soak into the ground downwind of the groundburst and dissipate through slow evaporation. This way, the course of the persistent cloud forms a "footprint" or contaminated zone, which remains dangerous for several days following the initial delivery.

The delivery of persistent agents is identical to non-persistent agents for both still air and wind effects. In still air, this is the only area to be contaminated. In wind, the cloud will move downwind.

This can get quite complicated, and casual players are encouraged to assume no wind when

persistent munitions are used.

For the die-hard players who anticipate modeling wind effects on persistent munitions, divide the footprint into two sections. The **head** of the footprint is the 180 degree arc that is upwind of the impact hex. The **track** of the footprint is the distance the impact centre will travel until CNC reaches zero.

The head of the footprint is treated as if there were no wind, and contamination and dissipation are resolved normally.

The track is treated as a column of chemicals--CNC of a hex is determined by measuring the shortest distance to the track and reading the CNC from the Delivery System Effects Table for the appropriate wind speed. Due to the denser nature of the persistent munitions for each phase of travel of the track, move down a further 4 lines on the table.

> **Example**: In a 10 HPP wind, a persistent chemical shell will determine its CNC values in its track from the 10 HPP line for the first 2-second phase (when the impact centre tracks from hexes 1 - 10 downwind of the impact hex). Then, for the second 2-second phase of travel, move down by 4 lines to 18 HPP wind (when the impact centre tracks from 11 - 20 hexes downwind). For the third 2-second phase of travel, move down a further 4 lines for 26 HPP wind, and so forth

> **Example**: A hex is 12 hexes away from a track in a 10 HPP wind, in the first phase of travel. With a persistent chemical munition, the resulting CNC is 1. Another hex, likewise 12 hexes away from the track, but within the second phase of travel of the track, has a CNC of 0 as read from the 18 HPP line of the table..

CONTAMINATION:

The difference between persistent and non-persistent agent is the persistent agent deteriorates much slower than non-persistent agents. This means that persistent agents contaminate anything in their path for a long period of time. As the persistent cloud moves downwind, the section of terrain it passed over remains contaminated at the CNC the cloud had when passing over.

> ***Example:*** *Taking the artillery shell in the previous example, but filling it with VX, a persistent agent, and assuming that a 9 HPP wind is blowing, the course of the cloud from 0 to 9 hexes has a CNC of 14. After the cloud passes over that section of terrain, the terrain remains contaminated and attacks targets at a CNC of 14. The course 10 to 18 hexes away has a CNC of 13 and the terrain continues to attack targets at a CNC of 13. The course 19 to 27 hexes away has a CNC of 12, and so forth.*

To model the deterioration of the persistent agent, find the CNC of the burst zone on the Delivery Systems Effects Table under the appropriate column for the delivery system. Read across the table to the "Pers." column under the "Elapsed Time" section of the table. This will give a time preceded by an "x", meaning that the time must be multiplied by the agent's

Persistence Multiplier (PM). The resulting number is the amount of time required for the agent to deteriorate to the next line of CNC. All contaminated zones downwind also drop in CNC by one line. Continue the process as long as required for the CNC in the burst zone to decrease to zero.

Note: The deterioration of persistent agents can be modified by environmental effects such as temperature and precipitation. See **Weather Effects** for more detail.

> ***Example:*** *Continuing the previous example, indexing a CNC of 14 for a 155mm shell gives a Pers. time of "x 20h", meaning that the Pers. time of 20 hours must be multiplied by the PM of VX. The PM(VX) is 2, so the CNC of the burst zone will decrease by 1 line to a CNC of 13 after 40 hours have elapsed from the initial explosion. All zones downwind will also decrease 1 line after that time has elapsed.*
>
> ***Example:*** *Indexing a CNC of 13 for a 155mm shell gives a Pers. time of "x 2d", or times 2 days. Multiplying this by the PM(VX) of 2 means that 4 days after the initial explosion, the burst zone and all the downwind contaminated zones drop in CNC by one line, and so on.*

USE IN ENCLOSED AREAS:
This is a very rare occurance, but can happen in the case of grenades being lobbed through windows or doors.If a groundburst dispersing CBW agents takes place inside an enclosed space, such as a building, first determine if the burst zone can be contained in the building according to area. If there is sufficient space to contain the burst radius, resolve the groundburst effects as usual. The area of the burst zone can be found by multiplying the square of the burst radius times 3.14.

Should the area of the burst radius be too large to be contained in the enclosed space, then multiply the CNC by the area of the burst zone divided by the area of the enclosed space.

> ***Example:*** *A burst-type tear gas grenade is lobbed into a room 2 hexes by 4 hexes (area = 8 hexes). The burst radius of the grenade is 3 hexes (area = 3 x 3 x 3.14 = about 28 hexes). The CNC of the grenade normally is a 7 for the burst zone (found off the Delivery Systems Effects Table), but in this enclosed area, the CNC = 7 * 28/8 = 24.5. This is why the use of tear gas inside of buildings can be a deadly affair.*

DELIVERY SYSTEMS:
Military delivery systems capable of delivering CBW agents through groundbursts include burst-type grenades, artillery shells, artillery rockets, and aircraft bombs. Refer to the PCCS Artillery System for SMK ratings for the various types of artillery shells. Refer to the PCCS Special Weapons Data Supplement for ratings for smoke grenades.

Non-military, or terrorist delivery systems generally consist of a container for the agent connected to an explosive charge. The size of the charge is important because too little charge and the agent does not disperse as widely as desired, and too much charge may destroy the agent or disperse it too widely to have an effective CNC. Ratings for these are still in development and will be posted as soon as they are available.

BARRAGES:

All CNC values are additive. If multiple shell patterns overlap, then the CNC values in the overlapping areas are added together.

> **Example**: A hex is overlapped by three chemical shell impacts of CNC 10, 3, and 2 respectively. The effective CNC of that hex is 15.

Dispersal Methods: Burning-Type Grenades and Projectors

This section deals exclusively with specialized riot control devices which use a smoke composition or compressed gases to deliver doses of irritating chemicals to a target.

The **PCCS Special Weapons Data Supplement** deals with burning type gas grenades in detail--this section has a few modifications.

Zig-Zag Grenades:
Zig-zag grenades have an angled vent and, as the chemical agent is forced through the vent, the grenade is pushed back in a spinning, bouncing trajectory. This makes the grenade unpredictable and difficult for rioters to pick up and throw back. Each impluse for the Grenade's DUR, roll a (6) and move the grenade 1 hex in the following directions.

Roll	Move
1	Away from the thrower.
2	Away from the thrower and to his right.
3	Towards the thrower and to his right.
4	Towards the thrower.
5	Towards the thrower and to his left.
6	Away from the thrower and to his left.

Use a counter to represent the grenade, and use other counters (or balls of cotton) to represent the smoke trail over the path. Move the smoke trail downwind by a number of hexes equal to wind speed.

Weather Effects

CBW agents are highly vulnerable to the environment in which they are released. The dispersing effects of winds have been covered in the previous sections. Other environmental aspects like temperature and precipitation can have tremendous effects on the spread and contamination of CBW agents.

TEMPERATURE:
Temperature can have marked effects on persistent chemical agents. As the temperature rises, the rate of evaporation of the persistent agent increases, thus decreasing the time of contamination. Conversely, as the temperature falls, evaporation is impeded and contamination time is increased. To model the effects of temperature, a persistence multiplier (PM) is used according to the expected high temperature during the days of contamination. The PM is used in exactly the same way as the PM for individual persistent agents.

Example: *A 155mm shell falls carrying VX (PM of 2). It sets up a burst zone of CNC=10. Reading across form a CNC of 10 on the Delivery Systems Effects Table for a 155mm shell under the Pers. column gives a persistence time of "x 20h" or times 20 hours. This is multiplied by the VX's PM of 2 for 40 hours. Under normal conditions, it would take 40 hours for the CNC to drop 1 line on the Delivery Systems Effects Table to a CNC of 9. However, the average high temperature for the days of contamination is 96 degrees. Evaporation is highly accelerated at such a temperature and the PM for temperature is a "x 0.10." This gives a new overall persistence time of 20 x 2 x 0.10 = 4 hours for the CNC to drop one line from a CNC of 10 to 9.*

The following table provides persistence multipliers for various temperature bands.

Persistence Multipliers at Various Temperatures

Temperature (F)	PM
86 +	x 0.10
77-85	x 0.50
68-76	x 1.00
59-67	x 2.00
32-58	x 5.00
Below 32	Special

Whenever the temperature falls below freezing, i.e. below 32 degrees F, all evaporation stops. The chemical agent will no longer be dispersing through evaporation until the temperature rises above freezing again. This means that a persistent chemical agent laid down in the early winter will still be contaminating ground at full strength until the spring thaw three or four months later. In polar regions, where the temperatures rarely rise above freezing, contamination could persist at high levels for decades. Temperature has no effect on biological and non-persistent chemical agents.

PRECIPITATION:
Non-freezing precipitation acts as a natural decontaminating device for chemical and biological agents. Rainfall washes off and disperses any contaminants, rendering them less harmful. In game terms, rainfall will lower the CNC of all persistent chemical and biological agents by a certain number of lines one the Delivery Systems Effects Table. This takes effect at the end of a period of rain, and time required to drop to the next level also starts when the overall rain ends. Naturally, contaminated surfaces must be exposed to the rain for the entire period of rainfall for the rainfall to be effective.

The following table details the effects of rainfall. To use the table, determine the initial level of rainfall, using the number of millimetres or inches as a guideline. This level of rain will be maintained until the amount of time found under the DUR column has elapsed. Then, the rain is reduced by (3) levels and the process continues until the rain level is reduced to zero. The Lines column gives the number of lines the CNC is adjusted downwards at the end of the DUR for that level of rainfall. If desired, The Gamemaster should, for role-playing purposes,

determine which part of the day the rain begins, using die rolls if necessary.

Rain Effects Table

Level	Type	Amount (mm/in)	DUR	Lines
0	None	0 mm / 0.0 in	n/a	0
1	Trace/Dew/Fog	5 mm / 0.2 in	1 h	0
2	Light	10 mm / 0.4 in	2 h	1
3	Medium	15 mm / 0.6 in	2 h	1
4	Heavy	20 mm / 0.8 in	2 h	2
5	Extreme	30 mm / 1.2 in	1 h	3

Frozen precipitation will only cover a layer of contamination and neutralize it until thawing, when the contaminated areas will be exposed and dangerous once again at the same CNC as when they were first covered with the frozen precipitation.

Chemical and Biological Defence

An important part of any CBW conflict is the development of countermeasures and defences to the CBW agents utilized by the other side. These defences can be broken down into the categories of detection, protection, decontamination, and treatment.

DETECTION:
There are various methods of detection available to military forces. However, the majority of these methods are oriented towards detecting blister and nerve agents. Militaries view these as being the most dangerous agents likely to be encountered on a battlefield.

All detectors provide warnings when the CNC of certain agents, usually blister and nerve agents, rises above 1. They will stop providing the warning when deactivated or when the CNC of the agent drops back below 1. All detectors are fallible, however, and even the slightest damage or blockage will mean that the detectors will provide false alarms, or worse, not go off at all. The various types of detectors are listed below, together with components and guidelines for use and failure of the detectors.

Smell: Any smells given off by the various agents are listed in Chapter 2. If the combatant can recognise the smell, then he can sound the alarm.
Components: Nasal sensory nerves. These tire after 2-3 minutes of exposure, so the smell seems to go away. Also, blockages such as gas masks being worn or nasal congestion from illness can prevent the nerves from sensing the smell.

Detector Paper: This is chemically-treated paper with an adhesive back, so that the sheet can be attached to an NBC suit. The paper changes color upon exposure to show a distinctively colored pattern of dots. The dots disappear when the paper is no longer contaminated. These are usually issued to all troops likely to encounter CBW. The Warsaw Pact forces also use detector powders
.
Components: Chemical reagents. These are deactivated by NBC decontamination chemicals, making the paper useless for detection. This is the most reliable method of detection, but does not show strength of contamination. Also, the combatant must look at the paper regularly to determine when chemical
agents are present.

Samplers: Samplers pass external air over an electrolytic cell which will react on contact with chemical agents. The cell can then trip a relay to sound a warning, transmit the information by radio to a remote alarm unit, or show strength and type of agent on an
LCD screen.
Sensor Components:
Battery: 15 Day life. Any damage to the battery means the detector will not work at all.

Pump: Used to draw air over the cell. MIN damage means that drawing power is impaired, and cell will not trip until CNC = 3. MAJ damage means the pump, and the detector, does not work at all.

Cell: Reacts with the presence of chemical agents. MIN damage means the cell will trip false alarms once every (10)+2 hours it is activated. MAJ damage means the cell will not work at all. Cells deteriorate to MIN damage after 6 months of use, and MAJ after 7 months.

Relay: Transmits electrical impulses from the cell to output devices. Any damage means the relay will not work at all.

Reservoir: Some detectors only. Holds chemicals which allow the cell to detect the chemical agents. Life of 15 days. Any damage means that the detector does not work at all.

Output Devices:
Alarm: A speaker activated by the relay which sounds a warning tone (ESM 70). MIN damage means the speaker will sound randomly once every (5) hours and, once tripped, continuously so long as the unit is activated. MAJ damage means the speaker will not work at all.

Display screen: On handheld models only. An LCD screen which indicates the strength and type of chemical agent encountered. Any damage at all means that the screen does not work.

Transmitter: Transmits an alert to a remote alarm unit up to 220 hexes by radio, or in some units, as far as a landline (wire) can reach. The radio signal is too weak to reach beyond 220 hexes. Any damage or EW jamming on the radio frequency being used means that the transmitter does not work at all. If the landline (if any) is cut, the transmitter does not work at all.

Infrared Remote Sampling System: This consists of an IR camera and computer processor mounted on a tripod. The camera covers a 60 degree arc and detects the presence of nerve agents by monitoring variation in the infrared spectrum. Range is direct line-of-sight for up to 2750 hexes.

Components:
IR camera: This is very sensitive. Any damage and the system does not work at all.

Processing Unit: This is the computer hardware and software which interprets the changes in the IR camera image and determines whether they are caused by chemical agents. MIN damage means that the system will trip randomly once every (5)+2 hours. MAJ damage means that the system does not work.
Battery: A Thermoelastic Generator (TEG) with a life of 24 hours. Any damage and the system does not work.

Transmitter: Transmits an alert to a remote alarm unit up to 220 hexes by radio, or in some units, as far as a landline (wire) can reach. The radio signal is too weak to reach beyond 220 hexes. Any damage or EW jamming on the radio frequency being used means that the transmitter does not work at all. If the landline (if any) is cut, the transmitter does not work.

PROTECTION:
Once a chemical agent is detected, there usually follows a mad scramble to don protective garments and seal up any NBC-shielded vehicles before the agent can cause any injury to personnel in the area of the attack. There are various levels of protection, and each has different advantages and disadvantages as detailed below.

Held Breath: Useful only against chemical agents which must be inhaled to cause damage. The number of phases of normal operation a combatant is allowed without breathing is equal to her health characteristic plus a 0-9 roll. This is determined separately for each combatant and represents how recently each has breathed. After
this time has elapsed, the person must draw breath and begin taking damage from exposure to the agent unless she has used the time to don better protective gear or removed herself from the contaminated area.

Handkerchief: A handkerchief held over the mouth and nose can filter out chemical aerosols and mists, but only to a certain degree. This method works only against agents which must be inhaled to cause damage. It has no effect against others. A person using a handkerchief will be attacked at an effective CNC equal to the normal CNC/2. If the handkerchief is wetted, this drops to

(CNC/2)- 1.

Gas mask/respirator: These are plastic masks which provide a seal around the face and isolate the nose, mouth, and eyes from contact with chemical agents by providing pure incoming air. Gas masks filter incoming air, while respirators provide air from a purified
air supply. Masks are effective against all agents which require inhalation or exposure to the eyes or mouth to work. They are not effective against all other kinds of agents. In combat situations of quick movement, it is easy for a mask to be jarred or displaced. If this happens, the seal is broken and the air inside the mask is contaminated at the CNC outside the mask. Putting the mask on again will only limit further exposure. While using a mask, a person's visibility is severely restricted, limiting his Field of View to 120 degrees, and giving him a -2 Visibility ALM.

Components:
Seal: Rubber seal at the fringes of the mask. Any damage above MIN here makes the entire mask useless.

Straps: Straps going around the mask and securing the mask to the face. If these are damaged, the mask must be held in place by one hand to remain effective.

Filter: Filters out CBW agents. A filter has a normal operating life of six months. Any damage means that the entire mask is useless.

Voicemitter: A special speaker element incorporated in some masks which allows the wearer to be heard speaking clearly. Damage here will not affect the protective capabilities of the mask, but will make the wearer's voice seem muffled (Reduce ESM by 10). This also applies to masks without voicemitters.

External air supply (EAS): This applies only to respirators. EAS are usually carried in steel tanks and are effective only for as long as the tank has capacity (Normally 20 minutes to 1 hour). Any damage here means that the EAS is useless.

Protective Coveralls: These are synthetic garments designed to prevent any contaminants from reaching the skin of a wearer. They are also available in a zip-up casualty bag designed to give protection to wounded who are unable to pull on coveralls. The coveralls are quite heavy and hot to wear, and all actions have a penalty of +1 AC while the garment is worn. After the allowed time wearing the suit has elapsed, this penalty increases to +2 AC.

Temperature (F)	**Allowed Time for Coveralls**
86 +	20 Minutes
77-85	30 Minutes
68-76	50 Minutes
59-67	2 Hours
Below 59	3.5 Hours

If the suit is worn for more than twice the allowed maximum time, the AC penalty rises to +4 AC. After four times the allowed time has elapsed, and the person begins to suffer heat injury and can no longer function. Frequent rest (5 in 20 minutes) and cooling sprays can increase the allowed time by 50%. Protective coveralls are usually integrated with a gas mask or respirator.

Components:
Cloth overlayer: Two layer suits only. Wicks the liquid agents away and keeps them on the surface of the coverall. Rips or tears in this layer mean that the agent is allowed to attack the impermeable layer. The cloth layer alone will still transmit liquid agents to the wearer's skin.
Impermeable layer: A layer of synthetic foam or rubber designed to prevent agents from penetrating. It depends on the nature of the agent involved whether a rip or tear in this layer will cause damage to or otherwise contaminate the wearer. This layer alone provides up to six hours of protection from liquid (persistent) agents, after which time the agent attacks at the highest CNC to which the coverall was
exposed. This time is increased to eight hours with a cloth overlayer.
Gauntlets: Impermeable synthetic gloves integrated with the coverall. Designed to protect the hands. Damage is as for the impermeable layer.
Overboots: Impermeable synthetic boots designed to fit over combat boots. These usually have treads and may even have ski bindings. Damage is as for the impermeable layer.

Special note on coveralls -- Fumbles: Protective coveralls incombat situations are often donned in moments of high stress. Usually, a CBW sensor has sounded an alarm and the combatant knows that he only has but moments to avoid being contaminated. In these situations, the high stress involved may make even veterans fumble with their coveralls and masks, thus wasting precious time. In
these situations, have each combatant roll less than or equal to his SAL on 3(6) for each article of the coverall being donned. Failure means that he has fumbled with the garment and requires an extra (3)+1 AC to put it on properly. Normal ACs
required to put on the various articles are given below.

	AC Required	
Article	**On**	**Off**
Gas Mask/Respirator	12	5
Gauntlets (each)	10	4
Coverall	32	20
Overboots (each)	15	10
Casualty Bag	35	24

Shielded Vehicles and Structures: Vehicles and structures which are CBW or NBC shielded make use of a mechanical filtration system to introduce fresh air and to provide a positive, or higher, air pressure inside the vehicle or structure than on the outside. This

way, if there are any minor leaks in the seals, the air will flow outside and not allow contaminated outside air in. This system is used on some AFVs, modern office buildings, modern military fortifications, and naval vessels.

Components:
Filter: Designed to capture CBW contaminants from air passed through it. Any damage makes the filter and the entire shielding useless unless the filter can be shut off and a backup system activated in its place.

Air Pump: This draws external air over the filter before passing it into the shielded compartment. Any damage will cause the air pump to fail, and cause air within the
compartment to become stale. Normal air flow over the filter will continue to ensure breathability. Positive air pressure cannot be maintained without the pump.

Seals: These are rubber or silicone rings which form an airtight connection between a hatch and its cover. MIN damage means that the seal is broken, but that positive air pressure, if it exists, will prevent contaminants from entering. MAJ
damage means that the seal is completely breached, and that positive air pressure will not be able to preventcontamination.

DECONTAMINATION:
Contamination will only happen with biological agents and persistent chemical agents. These agents will remain active until they are deactivated or dispersed. Decontamination is simply the use of chemicals or water to deactivate or disperse the agents.

Decontamination is accelerated naturally through weathering but can be accelerated even
further through the use of cleaning solvents and pressure sprayers. Still, whenever these artificial means are used, there is always the possibility that the cleaning was performed unskillfully, and that the contamination remains. For each person attempting cleaning, roll at Base Odds of 6 on a 3(6). Success means that the area that person was responsible for is no longer contaminated. Failure means that the area remains contaminated. The gamemaster should use the skill failure table to determine the
level of remaining contamination.

All militaries view decontamination as a priority in a CBW environment, and some, like the Warsaw Pact, have developed large and highly effective decontamination tools. The basic types of decontamination equipment are described below. Normally, if these
systems are damaged, they will not work at all.

Decontamination Powder: This powder is dispensed either in foil packs or

impregnated into brushes or mitts. One wipe of the powder is sufficient to absorb persistent chemical agents. The powder is usable only once, and is then discarded. One packet, brush, or mitt is sufficient to decontaminate an individual and his clothing.

Personal Decontamination Kits: These are issued to individual soldiers and contain sufficient decontamination powder and equipment to decontaminate an individual and his equipment. Special kits are available for heavy weapons and artillery. This process
can be completed in 15 person-minutes.

Scrubber and reservoir: This is a brush with a hose connected to a jerry-can type reservoir holding cleaning solution. In use, the brush is scrubbed against the contaminated surface while cleaning solution is injected into the brush and over the contaminated surface. One reservoir is usually sufficient to decontaminate an
APC in 1 person-hour. A supply of pressurized water is required.

Low pressure sprayer: A pressurized fire-extinguisher-type dispenser filled with decontamination chemicals. This is used for quick decontamination of essential surfaces until a more thorough cleaning can be done.

High pressure sprayer: This is a nozzle connected to a high pressure pump, which directs a pressurized spray of water or a cleaning solution at a contaminated vehicle. This is designed to decontaminate large AFVs and surfaces and will take up to 30
person-minutes for an AFV or 200 hex area.

Steam trailer: This is a water heating system which can provide steam jets or warm water showers for troops to wash contaminants off themselves. This usually takes about 5 person-minutes.

Jet Decontamination System: Warsaw Pact nations have mounted turbojet engines on truck chassis and pump cleaning solvents into the hot jet exhaust to create a hot, high-pressure sprayer. Working in tandem, these units can completely decontaminate an entire AFV in 3 minutes.

TREATMENT:
The treatment of casualties is detailed in the specific chapters on Chemical and Biological Agents. However, there are certain methods which are widely distributed among troops and are essentially first aid for CBW casualties. These can, in many cases, stabilize the patient until more effective treatment can arrive. The various types are detailed below with the number of AC required to use them.

Pralidoxime Mesylate Tablets:(AC: N/A) These are tablets currently used by British forces in cases where chemical attacks are likely. They are issued in day-packs of 4 tablets, with one tablet being ingested every six hours. The combatant who has been using these tablets for at least six hours is able to divide the dosage of Nerve Agents he takes by a factor of 4. This effect ends six hours after the last pill was taken.

Atropine Autoinjectors: (3 AC + 5 seconds) This is the most common type

of first aid for nerve agent poisoning. It is issued to every combatant likely to be in a CBW environment. The Atropine autoinjector consists of a retractable hypodermic needle capable of penetrating the thick fabrics of a protective coverall and injecting the combatant with a premeasured dose of atropine, or atropine and diazepam. Each unit can provide a maximum of three doses. In practice, the person showing symptoms of nerve agent poisoning removes a safety cap and presses the autoinjector against
his thigh and holds it there for 5 seconds while the injection takes place. He then swallows a diazepam tablet and repeats the injection/tablet therapy every 15 minutes for as long as the symptoms persist. The repeated dosages are regarded as one treatment for rules purposes. Newer autoinjectors dispense with the tablet. Note that the injection of atropine prior to showing the symptoms of nerve agent poisoning will make the person ill and incapacitate them. Atropine is highly poisonous.

Protective Ointment: (10 AC for face or hands, up to 45 AC for the entire body.) This is a cream which is applied to the skin of a person contaminated by mustard gas. The cream soothes the symptoms and deactivates the mustard gas still on the skin. The ointment is issued in small tubes, each sufficient for 1 person.

Send comments.

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Chemical Agents

For game purposes, a chemical agent is defined as a non-living substance which can interfere with or otherwise alter the functioning of a living organism. This page details the effects of a number of agents which are most likely to be encountered on a contemporary battlefield. The following rules cover the effects and treatment of chemical agents.

Chapter Links

- Toxification Rules
- Effects of agents: Symptoms
- Riot Control Agents
- Blood Agents
- Blister Agents
- Choking Agents
- Incapacitation Agents
- Nerve Agents
- Biological Toxins
- Defoliants

Toxification Rules -- Administration of Agents:

The basic unit of a chemical agent is a standard dose, which is a unit of biological effect. One standard dose of any agent is normally sufficient to induce a reaction in 80% of the human population. Increasing the number of standard doses administered will generate more advanced symptoms like coma and death, and will advance the rate of the appearance of symptoms as well. Because of the varying effectiveness of agents, the size of the standard dose changes tremendously from agent to agent.

Usually, a standard dose enters the combatant's body when he is exposed to a chemical cloud or a contaminated area. To determine the number of standard doses a combatant will take in a CW attack, index the CNC (modified for any protective measures the combatant is using -- Sec. 1.6) of the contaminated area or gas cloud at the combatant's location with the agent being used on the Chemical Agent Effects Table.

A "1" followed by a slash and a dash means that after the first minute of exposure, the combatant will take one dose and will not take another for as long as the symptoms last.

A "1" followed by a slash and another number means that the combatant will take one dose after the first minute, and will continue to take one more dose each time a number of minutes equal to

the second number has elapsed, given that he remains exposed to the agent.
An unasterisked number gives the amount of standard doses an unprotected combatant will take for every minute of exposure. If the number is followed by an asterisk, then the number gives the standard doses taken every ten phases, and a number followed by a double asterisk gives the number of standard doses per phase. Note, on single or double asterisked numbers, if exposure is less than ten phases or one phase respectively, gamemasters should prorate the dosage for the actual amount of exposure time.

> ***Example:*** *Donovan suddenly finds himself in the middle of a VR-55 cloud inside a warehouse as a cannister ruptures. The gamemaster states that the entire warehouse floor is covered by a weak VR-55 cloud to a CNC of 5. At this CNC, the dosage from skin absorption is 7*, or 7 doses every ten phases. Donovan quickly runs for the exit and leaves the cloud three phases later. The gamemaster prorates the number of doses taken by Donovan's exposure for 3 phases, so Donovan suffers 3 Phases * Dosage of 7 / 10 Phases = 2.1, rounded to 2 doses.*

Effects of Agents: Symptoms

An agent will usually progress through asymptomatic, early symptomatic, and advanced symptomatic phases. The strength of these phases and their speed of advance from one phase to the next can be altered by the number of doses taken by the combatant. If a combatant receives higher doses, the likelihood that he will progress to the next symptomatic phase is greater.

A combatant enters the asymptomatic phase automatically ten phases after exposure. The progress of the agent to higher phases can be stopped by making a Toxic Recovery Roll (TRR). This roll depends on the number of doses administered, the health of the target, and any treatment applied. The Base TRR is found on the Toxicity Table by indexing the level of symptoms with the number of doses administered as of a certain time.

Add the Base TRR to the target's current HLT level and any applicable treatment modifiers. Round the current HLT to the nearest whole number. If a 00-99 roll is less than this number, then the progress of the agent is arrested. Otherwise, the agent continues to the next phase of symptoms.

TRR = Base TRR + Current HLT + Treatment Modifiers

Timing:

All agents require time to work their effects. To model the time required for a chemical agent to force the appearance of advancing symptoms, a system of interval times (IT) is used. The IT is the amount of time required for the next higher level of symptoms to manifest.

A combatant has ten combat phases (20 seconds) before he enters the asypmtomatic phase. The total number of doses taken during these ten combat phases determines the length of the asymptomatic phase. The asymptomatic phase length is calculated by taking the Asymptomatic IT listed for each agent in the Agent Lists at the end of this section, and multiplying it by the IT Multiplier for the number of standard doses of agent administered and the method of administration. The IT multiplier is found on the Toxicity Table below.

Asymptomatic phase length = Asymptomatic IT * IT Multiplier

No symptoms appear during the asymptomatic phase. At the end of the asymptomatic phase, a

TRR is rolled. If the TRR is successful, the progress of the agent is arrested and there are no further ill effects. The value for Base TRR is taken from the "Asymptom." column of the Toxicity Table and the dosage level is equal to the total number of doses taken up to the end of the asymptomatic phase.
Because of the lack of symptoms, a medic will be unable to make a diagnosis as to the agent. However, medics can initiate a treatment if circumstances indicate the nature of the agent.

> ***Example:*** *Donovan (HLT = 14) has taken two doses of VR-55, a nerve agent, in ten phases of exposure. The length of the asymptomatic period is 10 phases * 0.7 for an inhaled method of administration = 7 phases. Seven phases after the ten phase "grace period," Donovan must roll a TRR to avoid having his symptoms progress to the early symptomatic phase. His TRR = Base TRR of -16 + HLT of 14 + Treatment Modifiers (none yet, so zero) for a TRR of -2. Donovan automatically proceeds to the next stage of symptoms.*

If the first TRR is failed, then the victim enters the early symptomatic phase at the end of the asymptomatic phase. The early symptomatic phase lasts a length of time equal to the Early Symptomatic IT multiplied by the IT multiplier for the total number of doses taken up to the end of the asymptomatic phase. During the early symptomatic phase, the combatant suffers the effects listed under the Early Symptoms field of the agent listing.

At the end of the early symptomatic phase, the combatant makes another TRR. Success in this TRR means that the progress of the agent is arrested and will remain at the early symptoms level of effect until the end of the early symptomatic phase. The victim will then suffer a debility for the listed Healing Time (HT). Failure of this TRR means that symptoms advance to the advanced symptoms level. Note that the Base TRR value is taken from the "Early" column of the Toxicity Table. The dosage level is
equal to the total number of doses taken up to the end of the early symptomatic phase.

> ***Example:*** *Donovan is now showing early symptoms and normally would continue to do so for (7 * IT mult of 0.7 = 4.9 minutes). But, at the start of this phase, he treats himself with atropine and diazepam from an autoinjector and automatically becomes incapac- itated from the atropine/diazepam effects. However, the atropine allows him to avoid the effects of the VR-55 for the duration of the early symptomatic phase. The atropine extends this phase for 4 hours, so four hours, 4.9 minutes later, Donovan makes his second TRR at Base of 6 + HLT of 20 + Treatment modifier of 20 = 46. Donovan rolls a 79 and fails, so he goes to the advanced symptomatic phase.*

If the second TRR is failed, then the toxicity advances to the advanced symptomatic phase at the end of the early symptomatic phase. The victim still suffers the early symptoms and suffers the advanced symptoms in addition. These symptoms last for the amount of time in brackets multiplied by the IT multiplier with the dosage level being equal to the total number of doses taken up to the end of the early symptomatic phase.
At the end of the advanced symptomatic phase, the victim makes a final TRR. Success in this TRR means that the progress of the agent is arrested and will remain at the advanced symptoms level of effect until the end of the advanced symptomatic phase. The victim will then suffer a debility for the listed Healing Time (HT). Failure of this TRR means that the victim succumbs to the agent and dies. Note that the Base TRR value is taken from the "Advanced" column of the Toxicity Table and the dosage level is equal to the total number of doses taken up up to the end of the advanced symptomatic phase.

> ***Example:*** *Donovan has suffered through the early symptoms and his symptoms would normally get worse to include all the early symptoms as well as the advanced symptoms.*

*He has also been med-evacked to a hospital facility where they have atropinized him and are treating him with nerve gas antidotes called reactivators. It is the atropine that allows him to avoid the convulsions and paralysis associated with the advanced symptomatic phase of VR-55. With the constant atropinization at the hospital, Donovan could extend the advanced symptomatic phase for up to 72 hours plus the allowed time for the phase, which is: (15 + (random roll of 7) = 22 minutes) * IT multiplier of 0.7 = 15.4 minutes.*

With the consent of the gamemaster, Donovan quick-time role plays through his treatment at the hospital and makes his final TRR. He needs to roll: Base of 49 + HLT of 14 + Treatment Modifiers of (30 for relieve symptoms (atropine) + 5 for the antidote) = 98. Donovan rolls 34 and survives. He will now be debilitated for 28 days as he heals from his exposure.

If the victim survives the agent after undergoing either the early or advanced symptomatic phases, then the victim suffers a debility for the listed healing time. This debility manifests itself by making the character fatigued. Also, if the character suffered physical damage in the administration of the agent, then the injured areas remain painful.

TOXICITY TABLE

Standard		Base TRR		IT Mult.		
Doses	Asympt	Early	Advanced	Inh/Inj	SkA	Ing
1	11	36	88	1	1	1
2	-16	6	49	0.7	0.9	0.9
3	-32	-11	26	0.6	0.8	0.9
4	-43	-24	10	0.5	0.7	0.9
5	-52	-33	-3	0.4	0.7	0.8
6	-59	-41	-13	0.4	0.6	0.8
8	-70	-54	-29	0.4	0.5	0.8
10	-79	-64	-42	0.3	0.5	0.8
12	-86	-71	-52	0.3	0.5	0.8
14	-92	-78	-61	0.3	0.4	0.8
17	-100	-87	-72	0.2	0.4	0.8
20	-106	-94	-81	0.2	0.3	0.7
24	-113	-102	-91	0.2	0.3	0.7
30	Auto	-111	-104	0.1	0.3	0.7
36	Auto	-119	-114	0.1	0.2	0.7
42+	Auto	Auto	Auto	0.1	0.2	0.7

Notes:
Inh/Inj -- Inhaled/Injected method of administration. Agent enters the bloodstream directly or

through the lungs.
SkA -- Skin absorption. The agent enters the bloodstream by passing through the combatant's skin. If the combatant is not wearing a gas mask and is inhaling the agent, then treat the method of administration as being inhaled/injected.
Ing -- Ingested method of administration. The agent enters the bloodstream through the stomach. Not used in CBW warfare.

Treatment of Agents:
Treatment modifiers are given in parenthesis for the Asymptomatic / Early Symptomatic / Advanced Symptomatic phases respectively.

Antidote (40/20/5) Antidotes are a program of pharmacueticals which neutralize the agent. They must be manufactured in medical labs of Tech Level 13 or higher and are agent specific. Very few agents have specific antidotes. An example of antidote therapy is the reactivator treatment of nerve agents.

Decontamination (40/30/10) Decontamination is the use of special chemicals to neutralize and remove contaminants from the skin surface. This method is only effective against agents which attack the skin or are absorbed through it. Included in this category is the decontaminating ointment used to soothe the effects of mustard gas poisoning.

Relieve Symptoms (0/20/30) This is the use of pharmacueticals or physical means to alleviate the victims pain and control his symptoms. For some of the more psychoactive agents, it also involves reducing external stimuli. Also, some agents which produce respiratory difficulty will require oxygen to be given to the victim. The atropine autoinjector therapy for nerve agent poisoning also falls into this category.

Washing (30/15/5) Washing is the use of water or other liquid to remove chemical agents from the skin surface. This method is effective against agents which either attack the skin or are absorbed through it.

Riot Control Agents

Riot control agents are low-lethality chemicals designed to cause extremely irritating symptoms in targeted personnel. Their primary use is the control of people in situations where the users are not averse to causing pain and other irritation to those people. The pain and irritation is so great that those exposed will attempt to leave the area where the agent was dispersed.

As the name suggests, riot control agents are commonly used to disperse rioting mobs of people and drive them away from crucial areas or riot control personnel. They are also used by civil authorities to drive criminals or other people out of buildings or shelters or away from behind barricades.

Riot control agents are broken down into lachrymators (causing tears), sternutators (causing sneezing), orticants (causing itching), and vomiting agents. Lachrymators and vomiting agents are the most common. Lachrymators are designed to cause sufficient pain and irritation to force people to leave an area. The harsher vomiting agents are designed to incapacitate. Both can kill in sufficient dosage. The most common types of riot control agents are described below.

Designation: CA
Common Name: Camite
Chemical Name: Brombenzylcyanide

Toxic by: Inhalation
Odor: Sour Fruit
Persistent: No.
Asymptomatic Period: 5 phases.
Early Symptoms [15 Minutes]: Irritation of eyes and mucous membranes, causing tears and nausea. Retching. Vomiting. Tightness in the chest and possible swelling of lung tissues. Involuntary blinking.
Advanced Symptoms [20 Minutes]: Incapacitation. Possible damage to eyes, mucous membranes, and lungs.
Treatment: Remove from exposure. Wash. Relieve symptoms.
HT: 3 days
Notes: Lachrymator. CA is a highly potent irritant, causing effects which are much more severe than other lachrymators. It is not very common due to its potency.

Designation: CN
Common Name:Tear Gas / CAP
Chemical Name: Chloracetophenone
Toxic by: Inhalation
Odor: Apple Blossoms
Persistent: No. However, this can be absorbed by fabrics in the area and anyone touching these fabrics will be attacked at CNC = 1 until the agent is removed by cleaning.
Asymptomatic Period: 5 Phases
Early Symptoms [15 Minutes]: Severe irritation of the eyes and mucous membranes, causing tears and nausea. Severe irritation of the upper respiratory tract, causing secretion of saliva and mucous. Coughing. Involuntary blinking.
Advanced Symptoms [15 Minutes]: Pain in lungs. Retching. Vomiting. Incapacitation. Possible damage to lungs, possible damage to kidneys.
Treatment: Remove from exposure. Wash. Relieve symptoms.
HT: 1 Day
Notes: Lachrymator. CN is a very common formulation of tear gas, although it has for the most part been supplanted in use by CS. It is designed as a very low-lethality crowd control agent and can still be found in the inventories of North American and Western European police departments. It has been inventoried by US military and police and other authorities since 1918, and it was supplied to ARVN forces (along with CS and DM) by the US government during the Vietnam war. It is currently being marketed as a personal defence aerosol.

Designation: CS
Common Name: Tear Gas / Pepper Gas
Chemical Name: Orthochlorbenzalmalononitrile
Toxic by: Inhalation
Odor: Pepper
Persistent: No. However, this can be absorbed by fabrics and anyone touching these fabrics will be attacked at CNC = 1 until the agent is removed by cleaning.
Asymptomatic Period: 2 Phases
Early Symptoms [15 Minutes]: Burning Pain and tearing of the eyes. Involuntary blinking. Runny Nose. Coughing. Nausea.
Advanced Symptoms [15 Minutes]: Vomiting. Retching. Incapacitation. Possible lung and kidney damage.
Treatment: Remove from exposure. Wash. Relieve symptoms.
HT: 1 Day.

Notes: Lachrymator. CS was first developed in 1928 and has become the most common riot control agent in North America and Europe. It is much more potent and faster acting than CN or CA, but is supposedly less lethal. This agent can be found in a wide variety of delivery systems in a vast number of police and military forces and is even marketed as a personal defence aerosol.

Designation: DA
Common Name: None
Chemical Name: Diphenylchlorarsine
Toxic by: Inhalation
Odor: Pepper.
Persistent: No.
Asymptomatic Period: 14 + (6) Minutes
Early Symptoms [30 Minutes]: Intense burning pain in nose and throat. Tightness and pain in the chest. Uncontrollable coughing and sneezing. Runny nose and thick saliva in mouth. Giddiness. Faintness.
Advanced Symptoms [2 Hours]: Nausea. Vomiting. Incapacitation. Possible mental depression.
Treatment: Remove from exposure. Wash. Relieve symptoms.
HT: 1 Day.
Notes: Vomiting Agent. First developed in World War I, it has mainly been supplanted by DM, which is easier to prepare and just as potent. It is used as a severe riot control agent in situations where deaths among the targets are acceptable. This is normally dispersed in a white smokescreen, but it is
colorless on dilution with air.

Designation: DM
Common Name: Adamsite
Chemical Name: 10 cloro-5, 10 dihydrochlorphenarsazine
Toxic by: Inhalation
Odor: Pepper
Persistent: No.
Asymptomatic Period: 14 + (6) Minutes
Early Symptoms [15 Minutes]: Intense burning pain in nose and throat. Tightness and pain in the chest. Uncontrollable coughing and sneezing. Runny nose and thick saliva in mouth. Giddiness. Faintness.
Advanced Symptoms [2 Hours]: Nausea. Vomiting. Incapacitation. Possible mental depression.
Treatment: Remove from exposure. Wash. Relieve symptoms.
HT: 1 Day
Notes: Vomiting Agent. This agent is the preferred crowd control agent of the Soviet Union and it has replaced DA in most inventories. It is a highly potent, and is used as a severe riot-control agent where deaths among the targets are acceptable. It was used in Vietnam against tunnel complexes. In such confined areas, the concentrations can become highly lethal. This agent is normally dispersed in a yellow smokescreen, but is colorless on dilution with air.

Designation: CN/DM mixture
Common Name: "Super" Tear Gas
Chemical Name: See individual entries.
Toxic by: Inhalation
Odor: Pepper/Appleblossoms
Persistent: No.

Asymptomatic Period: 5 phases
Early Symptoms [30 Minutes]: Severe burning pain in eyes and throat. Tearing of eyes and runny nose. Tightness and pain in the chest. Nausea. Uncontrollable coughing and sneezing. Thick saliva. Incapacitation after 15 minutes. Giddiness.
Advanced Symptoms [2 Hours]: Vomiting. Possible mental depression.
Treatment: Remove from exposure. Wash. Relieve symptoms.
HT: 1 Day
Notes: This is a combination of CN and DM and was used by American forces in Vietnam. It is still in use by military forces. This is an extremely severe crowd control agent and the combined agents are more effective and more lethal than
each agent individually. It is not intended as a crowd control agent unless deaths and other injuries are acceptable. Because of this, it has been relegated to counterinsurgency use.

Blood Agents

Blood agents are a legacy from World War I, where they were used extensively. They proved very difficult to handle as some were unable to be properly dispersed and all were able to penetrate the gas masks of the day. At CNCs greater than 7, they will penetrate all modern gas masks (attack at CNC minus 6), and at a CNC greater than 10, they will penetrate any air filtration system (attack at CNC minus 9). Only special filters which are proof against these agents will keep them from penetrating. Although blood agents are not stockpiled to the same extent as nerve agents and others, they are still considered potential CW weapons by all militaries.
Blood agents work by interfering with the oxygen circulation in the bloodstream. They also paralyze the respiratory centre in the brain and force the circulatory system to fail. The victim dies quite suddenly of asphyxiation and circulatory failure.

Designation: AC
Common Name: Prussic Acid
Chemical Name: Hydrogen Cyanide / Hydrocyanic Acid
Toxic by: Inhalation
Odor: Very faint scent of Peach Pits or Bitter almonds.
Persistent: No.
Asymptomatic Period: 10 minutes
Early Symptoms [10 Minutes]: Uneasiness. Vertigo. Deep, heavy breathing. Nausea. Headaches. Uncontrollable blinking.
Advanced Symptoms [10 Minutes]: Unconciousness. Convulsions.
Treatment: Antidote. Relieve symptoms.
HT: 5 Days.
Notes: This was used by the French forces against the Germans to surprisingly little effect in World War I. However, the formula has been improved since then to make this agent highly lethal. In sufficient concentrations, death is almost
immediate. Low concentrations have little aftereffect on survivors, while very high concentrations may cause permanent mental damage because of the oxygen-blocking action. This may manifest as irrationality, diminished reflexes, and unsteadiness that may last for weeks or years.

Designation:CK
Common Name: None
Chemical Name: Cyanogen Chloride
Toxic by: Inhalation
Odor: Pungent, biting odor
Persistent: No.
Asymptomatic Period: 5 Minutes.

Early Symptoms [10 Minutes]: Immediate, intense irritation of the eyes, nose, and throat. Tears produced. Coughing. Tightness in the chest. Dizziness.
Advanced Symptoms [20 Minutes]: Unconciousness. Convulsions, retching. Involuntary urination and defecation.
Treatment: Antidote. Relieve symptoms.
HT: 7 Days. Survivors may have chest pains, persistent cough, severely labored breathing, and cyanosis (blue skin resulting from a lack of oxygen. Normally manifesting around the fingernails.)
Notes: This lethal agent is unlikely to be used in warfare because the strong irritant action gives warning to the targets that they are under CW attack. Nevertheless, the agent is stockpiled. Like AC, the potential exists for permanent
mental damage due to the oxygen-blocking action.

Blister Agents

Blister agents, or vesicants, have a characteristic action by causing blistering or burns, and thus destruction, of any contacted animal cells. Skin contact causes these characteristic and painful blisters and burns to develop a few hours following exposure. A similar process happens with eye contact, and the blistering and irritation can lead to a temporary blindness or permanent eye damage. If the blister agent is inhaled, the sensitive tissues in the respiratory tract and lungs are attacked and blistered, leading to fluid in the lungs and death. Finally, ingestion of the blister agent, through eating of contaminated food or drinking of contaminated water, can lead to a slow poisoning of the victim. In order to remain unaffected in a blister agent attack, the combatant must be wearing the full NBC coverall (including a gas mask) or be housed in an NBC-shielded vehicle or building. Avoiding any contact at all with the agent is imperative.

As a guideline, the effects can be classified as skin, eye, respiratory, and intestinal effects. A person without any protection will be exposed to skin, eye, and respiratory effects. A person wearing a coverall, but without a gas mask will also be exposed to eye and respiratory effects, but skin effects will be limited to a smaller area. A person wearing a gas mask, but no coverall, would be exposed to skin effects only, but over much of his body. Finally, a person would be exposed to intestinal effects only if he ate or drank contaminated food or liquid. The various symptoms for each effects class are listed separately in each entry. Gamemasters should determine which effects apply to each casualty and administer those effects at the appropriate time.

Skin Contact:
The amount of damage caused by the blister agents in skin contact will vary according to the amount of exposed skin. Each entry will provide a PD value for each percent of skin contacted. This is the amount of PD each character suffers from burns for each 1% of skin surface contacted by the blister agent. So, if a character suffered mustard gas burns to one hand, he would take 2% * 4PD or 8 PD. The following table provides a list of skin areas and their relative percentages.

Body Part Skin Percentage
Face 3%
Rest of Head & Neck 6%
Front Torso 18%
Back Torso 18%
Groin/Genitals 1%
Each Arm (Front & Back) 7%
Each Hand (Front & Back) 2%
Each Leg (Front & Back) 7%
Each Foot (Front & Back) 2%

A tear or bullet-sized hole in the CBW coverall or mask will expose roughly 1% of skin per tear.

The gamemasters should adjust this upwards for larger tears.

Background:
Blister agents consist primarily of the mustard gas group of chemicals, which were first synthesized in 1859, and saw widespread use in World War I, although the effects were limited by the delivery systems used. With the improvement in delivery systems since World War I, mustard gas has become much more dangerous to combatants and has remained in several nation's inventories. In fact, it was used as late as 1985 by Iraq in the Iran-Iraq war and Iraq has continued to threaten to use it against its enemies in the Persian Gulf region.

As evidenced by Iraqi actions, blister agents remain likely to be used in a future conflict. They can be dispersed from shells and by aerial spraying, and their persistence means that they can continue killing for weeks after the initial attack.

Persistence is a special feature of blister agents. Blister agents are dispersed in the form of liquid, which soaks the ground and targets in the area. The liquid will evaporate over time and is not completely neutralized until it has evaporated. The liquid can also be captured by soil and plants and prevented from evaporation. In the Argonne region, the plants and soil still retain concentrations of mustard gas fired in German shells during the later years of World War I. Careless civilians in the area are still burned by the mustard gas laid down more than seventy years ago.

Designation:HD or H
Common Name: Mustard Gas / Distilled Mustard / Sulphur Mustard
Chemical Name: Bis (2-chloroethyl) sulphide
Toxic by: Skin Absorption or Ingestion.
Odor: Garlic or horseradish (faint)
Persistent: Yes. PM = 1.5
Asymptomatic Period: 3 + (6) Hours
Early Symptoms: [10+(5) Hours]
Eyes: The eyes begin tearing and feel gritty. This is followed by minor swelling of the eye surface.
Skin: The skin surface turns red, resembling a sunburn in appearance and pain. This is followed in the latter half of the early symptomatic phase by the formation of large, extremely painful blisters.
Blisters are the worst in damp, moist areas of the skin, such as armpits, genitals, and folds of the skin. The casualty takes 4 PD for each percent of skin exposed upon formation of the blisters.
Respiratory: Cough and hoarseness which may develop to loss of voice. Increased mucous production in throat and lungs.
Intestinal: Abdominal pain, nausea, vomiting, and diarrhea.
Advanced Symptoms: [1+(2) Days]
Eyes: Severe blistering and pain which will result in temporary obstruction of vision during this phase. Some destruction of eye tissues and further swelling may occur. Eyes will be very sensitive to light. If the eyes have been exposed, a failed TRR
at the end of this phase will mean vision impairment for 3 + (3) months. A person will never die as a result of only having the eyes contacted by mustard gas.
Skin: Severe blistering with some destruction of skin. Also malaise, vomiting, and fever will occur and may advance to heart irregularities and cerebral depression. A
failed TRR at the end of this period means the casualty dies.
Respiratory: Fever, labored and noisy breathing, and the possible development of fluid in and inflammation of the lungs. A failed TRR at the end ofthis period means the casualty dies.
Intestinal:[1+(2) Days]: Fever, malaise, and vomiting which may advance to heart

irregularities and cerebral depression. A failed TRR at the end of this period means the casualty dies.
Treatment: Decontamination or Washing. Relieve Symptoms.Antidote.
HT: Special. Skin injuries heal slowly, so take total PD of skin injuries and determine HT from the Medical Aid and Recovery Table (5A) of Phoenix Command, and multiply that HT by 5. Other effects will usually heal in 3+(3) weeks.
Notes: Vesicant. H (Mustard) and HD (Distilled Mustard) are part of the sulphurous mustard family and remain quite common among various militaries. They are likely to be used in a future war involving CW weapons.
Both H and HD are almost indistiguishable in effect from one another. H is an earlier formulation which was used in World War I and stockpiled in World War II as HT, a 60/40 mixture of H and T. HD is the formula currently stockpiled by most
CW-capable militaries.
Repeated exposures are cumulative if they occur during the symptomatic time.
Gamemasters should use the HD and H entry to determine the effects of Q and T. The symptoms of Q and T are identical to HD and H. Q is the designation for sesqui mustard (1,2 Bis (2-chloroethylthio) ethane). T has no common name, but is 1,2 Bis (2-chloroethylthioethyl) ether. Both of these are more potent than HD or H, and these may be stockpiled. There is no evidence to indicate the extent of stockpiling of Q and T, but it is suspected that they are less common than HD or H.

Designation:HN
Common Name: Nitrogen Mustard
Chemical Name: Tris (2-chloroethyl) amine
Toxic by: Skin Absorption or Ingestion.
Odor: Fish (faint), or odorless
Persistent: Yes. PM = 1.5
Asymptomatic Period: (3) * 20 Minutes
Early Symptoms: [10+(5) Hours]
Eyes: The eyes begin tearing and feel gritty. This is followed by minor swelling of the eye surface.
Skin: The skin surface turns red, resembling a sunburn in appearance and pain. This is followed in the latter half of the early symptomatic phase by the formation of large, extremely painful blisters. The casualty takes 4 PD for each percent of skin exposed upon formation of the blisters.
Respiratory: Cough and hoarseness which may develop to loss of voice. Increased mucous production in throat and lungs.
Intestinal: Abdominal pain, nausea, vomiting, and diarrhea.
Advanced Symptoms: [1+(2) Days]
Eyes: Severe blistering and pain which will result in temporary obstruction of vision during this phase. Some destruction of eye tissues and further swelling may occur. Eyes will be very sensitive to light. If the eyes have been exposed, a failed TRR at the end of this phase will mean vision impairment for 3 + (3) months. A person will never die as a result of only having the eyes contacted by mustard gas.
Skin: Severe blistering with some destruction of skin. Also malaise, vomiting, and fever will occur and may advance to heart irregularities and cerebral depression. Also, blood and lymph tissues are affected, and may progress to anemia. A failed TRR at the end of this period means the casualty dies.
Respiratory: Fever, labored and noisy breathing, and the possible development of fluid in and inflammation of the lungs. Also, blood and lymph tissues are affected, and may progess to anemia. A failed TRR at the end of this period means the casualty dies.
Intestinal: Fever, malaise, and vomiting which may advance to heart irregularities and cerebral depression. A failed TRR at the end of this period means the casualty dies.
Treatment: Decontamination or Washing. Relieve Symptoms. Antidote.

HT: Special. Skin injuries heal slowly, so take total PD of skin injuries and determine HT from the Medical Aid and Recovery Table (5A) of Phoenix Command, and multiply that HT by 5. Other effects will usually heal in 3+(3) weeks.
Notes: Vesicant. HN-1, HN-2, and HN-3 are variations on the nitrogen mustard formulation. They are faster acting than the sulphur mustards and generally produce similar effects to the sulphur mustards. Nitrogen mustards, for unclear reasons, also have certain effects on the blood and white blood cells. Although stockpiled during World War II, the HN series of agents is not expected to be encountered on a modern battlefield.

Designation:CX
Common Name: Phosgene Oxime
Chemical Name: Dichloroformoxime
Toxic by: Skin Contact
Persistent: Yes. PM=1
Odor: Very disagreeable, penetrating odor.
Asymptomatic Period: 10+(5) Phases
Early Symptoms: [30 Minutes]: Extreme, stinging pain in contacted areas, causing 2 PD per skin percentage contacted. Tearing of eyes. Contacted areas form welts. If inhaled, then similar pains encountered in respiratory tract.
Advanced Symptoms: [36 Hours]: Welts develop into blisters, causing a further 2 PD per skin percentage contacted. Swelling in lungs starts, followed by nausea. Overall cyanosis followed by difficulty breathing. Breathing is noisy, and a white or yellow froth may fill the lungs.
Treatment: Wash. Relieve Symptoms
HT: 2 Months, with persistent itching and scarring of contaminated areas.
Notes: Vesicant/Choking Agent. CX is often referred to as a nettle gas, because of its highly painful method of skin attack, likened to "being thrown into a bed of stinging nettles." CX also has the asphyxiating effect of phosgene gas in higher concentrations. CX was first considered in the 1930s by the Germans, and is said to have been stockpiled by the Soviets during World War II. The extreme pain associated with contact means that this agent would not be used on a modern
battlefield, where a more insidious, non-irritating method is preferred to maximize exposure and casualties. It could be used in the counter-insurgency role, where the irritation would actually help in incapacitating guerrilla forces. Whether CX is presently stockpiled is unknown.

Arsenical vesicants are uncommon. They work as a systemic poison by penetrating the skin and causing arsenic-like symptoms.

Designation:ED
Common Name: The Dicks
Chemical Name: Ethyldichlorarsine
Toxic by: Skin Absorption
Persistent: Yes. PM = 0.1
Odor: Fruity smell.
Asymptomatic Period: 10 Phases
Early Symptoms [24 Hours]: Itching and irritation of the skin along with the development of painful blisters. Skin turns a dead grey in exposed areas. If the eyes are exposed, they will also be irritated and will close due to swelling in the first hour. If inhaled, then coughing and hoarseness, along with pain in the respiratory tract appears. 3 PD for percentage of exposed skin.
Advanced Symptoms [48 Hours]: Symptoms persist, with pain slowly fading. Symptoms include shock (cold skin and cyanosis resulting from improper blood flow), diarrhea,

restlessness, weakness, and subnormal temperature.
Treatment: Decontamination or Wash. Relieve Symptoms. Antidote.
HT: 5 Days. Skin blisters and burns take normal PD HT * 5 to heal.
Notes: Arsenical Vesicant. ED was developed by the Germans in World War I. It is unlikely to be stockpiled or used in a future conflict. ED is listed in reference sources as being persistent, but on the order of 2-3 hours, making it almost useless for area denial. Also, water degrades the effectiveness of ED, making the agent effectively non-persistent in moist climates, and useless in rainy weather.

Designation:L
Common Name: Lewisite
Chemical Name: Chlorvinyl Dichlorarsine
Toxic by: Skin Absorption
Persistent: Yes. PM = 1.
Odor: Sharp smell of Geraniums
Asymptomatic Period: 10 Phases
Early Symptoms [24 Hours]: Stinging and itching of the skin along with the development of painful blisters.Blisters cause 5 PD for each percentage of exposed skin. Skin turns a dead grey in exposed areas. If the eyes are exposed, they will also be irritated and will close due to swelling of the lids in the first hour. If inhaled, then coughing and hoarseness, along with pain in the respiratory tract appears--similar to riot control agents.
Advanced Symptoms [36 Hours]: Symptoms persist, with pain slowly fading. Symptoms include shock (cold skin and cyanosis resulting from improper blood flow), diarrhea, restlessness, weakness, and subnormal temperature.
Treatment: Decontamination or Wash. Relieve Symptoms. Antidote.
HT: 5 Days. Skin blisters and burns take normal PD HT * 5 to heal. Note, in large concentrations, permanent eye damage can occur if the eyes have been exposed.
Notes: Arsenical Vesicant. Lewisite is very similar in effects to ED and has similar weaknesses. L has substantially reduced effectiveness in moist climates and rainy weather. It was developed by the Americans in the later part of World War I but never used in that conflict. During World War II, an antidote cream was developed: British Anti-Lewisite or 2,3,dimercaptopropanol, more commpnoly called BAL. BAL is also effective against ED. Lewisite is still stockpiled by some minor CW-capable militaries, and it was used by Iraq in the Iran-Iraq war.

Choking Agents

Choking agents were developed in World War I, and were some of the most lethal agents used in that war. However, over time, they have been supplanted by other, more potent agents so they are very rarely stockpiled. They are not expected to be used on the battlefield, and are easy to counter with contemporary gas masks and filtration systems.
Choking agents work on the respiratory tract of a combatant by destroying its ability to transfer oxygen to the blood. Some even work by destroying the respiratory tract itself. The end result is that the exposed combatant asphyxiates.

Designation:CL
Common Name: Chlorine Gas
Chemical Name: Chlorine
Toxic by: Inhalation
Persistent: No.
Odor: Smell of bleach.

Asymptomatic Period: 10 Phases
Early Symptoms [(4) Hours]: Coughing and tearing. Strong burning and irritation of the respiratory tract. Pain in chest and difficulty breathing.
Advanced Symptoms [(3) Days]: Symptoms grow worse. Drowsiness. Skin takes on a bluish or greyish cast cyanosis (lack of oxygen). Lungs expel a frothy yellow-pinkish fluid as lung alveoli are ruptured. Rapid, shallow breathing. Blood thickens, causing heart difficulty.
Treatment: Remove from exposure. Rest. Relieve Symptoms.
HT: 4 Days. During healing, respiratory symptoms will
continue, but diminish with time.
Notes: Chlorine was the first gas used by the Germans in World War I. It remained in use for a short time until the Allied powers were able to develop effective mask filters to counter the effects. Presently, Chlorine is not stockpiled by any CW-capable nation and is not expected to be used in any future conflict. This does not mean that it could not be used in a terrorist or low-intensity conflict as an expedient terror weapon.
Chlorine is dispersed in a pale yellow-green cloud and can be released through groundburst explosions, aerial spraying, or cylinders. Effective protection is provided by any gas mask developed after 1915.

Designation:PS
Common Name: Chlorpicrin
Chemical Name: Chlorpicrin.
Toxic by: Inhalation.
Persistent: No.
Odor: Pungent odor.
Asymptomatic Period: 5 + (3) Minutes
Early Symptoms [4 Hours]: Coughing and tearing. Strong burning and irritation of the respiratory tract. Pain in chest and difficulty breathing.
Advanced Symptoms [(3) Days]: Symptoms grow worse. Drowsiness. Skin takes on a bluish or greyish cast from lack of oxygen. Lungs expel a frothy yellow-pinkish fluid as lung alveoli are ruptured. Rapid, shallow breathing. Blood thickens, causing heart difficulty.
Treatment: Remove from exposure. Rest. Relieve Symptoms.
HT: 5 Days
Notes: Chlorpicrin is an obscure agent which was developed in World War I and kept available in World War II. It is not expected to be presently stockpiled by any nation. Chlorpicrin has the strongest irritant action of any of the choking agents and is noted as a strong lachrymator. It is also noted for its cumulative action of progressively increasing susceptibility. Gamemasters may wish to reduce a
combatant's TRR roll by (5) percentiles for each previous exposure within the prior month.

Designation:CG
Common Name: Phosgene
Chemical Name: Phosgene Carbonyl Chloride
Toxic by: Inhalation
Persistent: No
Odor: Strong odor of musty or new-mown hay or grass.
Asymptomatic Period: (10) Minutes
Early Symptoms [20 Minutes]: There may appear coughing, tearing, nausea, headache, a feeling of tightness in the chest, and possibly vomiting. This is then followed by a latent period of NO SYMPTOMS for another 2 * (10) Hours.
Advanced Symptoms [2 * (10) Hours]: Rapid shallow breathing, painful cough, and blue or grey cyanosis. This may be accompanied by nausea and vomiting. These symptoms advance to include discomfort and apprehension. A frothy

yellow liquid is expelled from the lungs and breathing becomes labored and noisy.
Treatment: Remove from exposure. Rest. Relieve symptoms.
HT: 7 Days
Notes: Phosgene gas was the most lethal gas to be developed and used during World War I. It was even stockpiled during World War II and was allegedly used in by Egyptian forces in their intervention in Yemen. It may still be stockpiled by minor CW-capable nations, but is not expected to be used in any future conflict. Phosgene's main action is to force oedema, or fluid, into the lungs. The oedema is expelled through the nose and mouth through coughing as a frothy yellowish sputum. Much of the oedema is drawn from the blood, which causes the blood to thicken (haemoconcentration), making it harder to circulate. The haemoconcentration and poor oxygen transfer caused by the oedema in the lungs causes asphyxiation and can lead to heart failure.

Incapacitating Agents

Incapacitating agents are obscure chemicals designed to render troops unable to fight without causing physical harm. Not surprisingly, they were developed as a humane method of warfare and were to be used to make enemy troops unable to fight, thus allowing the user the ability to conquer the enemy without causing or sustaining casualties.

These agents are divided into physical incapacitants, which cause unconciousness, and psychotomimetric agents, which cause temporary mental disturbances such as hallucinations, memory lapses, and unpredictable or maniacal behavior. They are often referred to as "on the floor" or "off the rocker" agents respectively.

These first development work of these agents was done by the United States in the 1950s and 1960s under a chemical development program which focussed on psychotomimetric agents. After years of testing and even stockpiling an agent called BZ, the United States dropped the program in the 1970s. The psychotomimetric agents examined lead to highly unpredictable behavior. Such behavior is undesirable in military situations. While under the effects of the gas, enemy troops could just as easily curl up in fetal positions or launch frantic, berserker-style attacks, made even more dangerous if the enemy commands weapons of mass destruction.
There have been allegations that the Soviet Union has recently developed and employed a physical incapacitant called Blue-X, which is designed to knock out enemy troops. Blue-X has allegedly been used by Soviet Forces in Afghanistan and by Vietnamese forces in Cambodia. These reports remain unconfirmed as of this writing.

Designation:BZ
Common Name: Buzz
Chemical Name: Unknown
Toxic by: Inhalation or Injection.
Persistent: No
Odor: None
Asymptomatic Period: 3 * (10) Minutes
Early Symptoms [4 Hours]: Parched nose, mouth and throat. Dry, flushed skin. Headaches, vomiting, blurred vision, and dizziness. Interference with ordinary functioning manifesting in an aimless stumbling and slurred voice or incoherent mumbling. Slowing of physical and mental activity. May be giddiness or drowsiness.
Advanced Symptoms [4 Hours]: Disorientation, visual and auditory hallucinations, and lost memory. Strange behavior may manifest with the causalty behaving maniacally or docily and with the behavior altering unpredictably. Body temperature rises.
Treatment: Relieve symptoms. Rest. Antidote (?).
HT: 4 Days. Unpredictable behavior continues during this time but gradually diminishes.

Notes: Psychotomimetric Incapacitant. BZ is a mysterious chemical developed by the United States in the 1950s and 1960s and stockpiled until the 1970s. It was never used and is not expected to be used in any future conflict. The unpredictable nature of BZ casualties made the agent useless except in very limited circumstances, such as counterinsurgency warfare. The effect of BZ is to interfere with the normal mental functioning of the combatant by causing hallucinations and disorientation, not unlike the effects of popular narcotics. The combatant is effectively placed in a bizarre "dreamworld" and may or may not interact with reality. In all cases, there is no way of determining exactly how he will react. Rational thought processes do not apply. One moment, the casualty may be screaming in terror and the next he may be giggling sporadically while firing at any targets including foliage and friendly troops. Even worse, he may fully realize what he is doing and still do it because it makes him happy at the moment. Combatants taking the same dosage are expected to react in radically different ways. The nature of these bizarre effects led many people to believe that BZ was narcotic in origin, such as an LSD deriviative. However, it is more likely a glycollate, such as the quinuclidinol glycollates or the N-methyl 3-hydroxypiperidyl glycollates. The exact formulation has never been disclosed by the United States. If it is a piperidyl glycollate, then an antidote such as 1,2,3,4, tetrahydro-9-amino acridine may be applicable. It is not known if the United States has developed or stockpiled any sort of antidote. No other nations are expected to possess BZ.

Designation:Blue-X
Common Name: Blue-X
Chemical Name: Unknown
Toxic by: Inhalation
Persistent: No
Odor: None
Asymptomatic Period: (10) Minutes
Early Symptoms [(4) Hours]: Unconciousness.
Advanced Symptoms [3 + (3) Hours]: Continued, with possible development of Central Nervous System--manifesting as slowed heart rate and shallow breathing, both of which worsen as the patient gets closer to death.
Treatment: Relieve symptoms.
HT: 1 Day
Notes: Physical Incapacitant. Blue-X has allegedly been developed and used by the Soviet Union in the 1980s. Vietnamese forces have also allegedly used it in their intervention in Cambodia. Blue-X works as a sort of general anaesthetic, causing complete unconciousness very rapidly and wearing off 2-8 hours later with no aftereffects. Reports of combatants state that Blue-X was dispersed in aircraft and mortar shells. Beyond this, very little is known about the agent. If Blue-X does in fact exist, it is probably currently stockpiled by the Soviet Union and other CW-capable Warsaw Pact forces. Its primary use could be in counter-insurgency roles and would allow the capture of prisoners for interrogation. In a superpower conflict, Blue-X could also be used to aid in the attack of conventional forces, or assist airborne insertions into the enemy rear by reducing the amount of concious defenders.

Nerve Agents

Nerve agents have become the primary chemical weapon on the modern battlefield. They are highly toxic substances which cause rapid death by paralyzing the muscles in a human or animal body. Because of their toxicity, nerve agents are considered strategic weapons. Where previous chemical agents could only be used locally, to attack a few troops, nerve agents could be used to attack entire populations.
The nerve agents were first developed in the 1930s by the German I.G. Farben chemical

company. They were the result of Farben chemist Gerhard Schrader's work into organophosphorous insecticides. The first agent prepared was DFP, but this was soon replaced by examination of tabun, sarin, and soman. While the Allies continued development and production of DFP throughout the war, the Germans produced and stockpiled tabun. Two plants for the production of sarin were under construction by 1945, and soman had just reached the laboratory stage. Although the Allies had examined similar agents, they did not even approach the level of the German program by war's end.
During World War II, nerve agents were not used. Following the war, the Soviet forces occupied the tabun plants and transported them and their 12,000 tons of tabun back to the USSR. Allied forces did the same with whatever chemical research they could find. Further development allowed the production and stockpiling of VX in the United States, and VR-55 in the Soviet Union.

Action:
Nerve agents are organophosphorous compounds which attack animal and human nerve cells and inhibit the action of acetyl- cholinesterase. This enzyme is important in the control of nerve impulses.
Normally, when a nerve impulse reaches the end of a nerve cell, the cell releases an enzyme called acetylcholine. The acetylcholine spreads across the synapse, or space, between two nerve cells, and stimulates the next nerve cell in the se- quence. Immediately following the release of acetylcholine, the first nerve cell releases acetylcholinesterase, which neutralizes the effect of the acetylcholine and stops the stimulation of the next nerve cell in the sequence.
With nerve agent poisoning, the agent bonds with acetyl- cholinesterase, so there is nothing to counteract the effects of the acetylcholine. In effect, nerve cells can be "switched on" and cannot be "switched off." The result is a contraction and locking of muscles in the entire body. Muscles contract in the cornea, causing a temporary loss of sight. The body undergoes convulsions and paralysis. Finally, the diaphragm becomes paralyzed, preventing the drawing of breath, and the casualty asphyxiates.

Therapy and Treatment:
Therapy of nerve agent poisoning in all cases falls in two classes: the blocking of acetylcholine, and the release of acetyl- cholinesterase.
The blocking of acetylcholine is the standard technique and is achieved through the use of atropine, often issued to troops in the form of autoinjectors. Atropine is itself a very toxic substance and will incapacitate the combatant for a period of at least four hours following the injection. Further therapy includes the taking of diazepam to counteract the convulsive effects of atropine on the brain. Normal treatment for heavy exposure requires atropinization of the casualty for at least two days. Atropine therapy is considered relief of symptoms.
If atropine is given to the casualty, the effects of nerve agent are offset for four hours, regardless of the TRR. After four hours, the effects start again from where their action was blocked. Atropinization can only be used for 72 hours before it becomes ineffective. If, however, the end of a symptomatic period is reached and a TRR roll is successful, then the nerve agent is deemed neutralized.

> ***Example:*** *In a previous example, Donovan inhaled two doses of VR-55 and used his autoinjector to take a dose of atropine. Now, the amount of time left before he must make his next TRR roll is (7 Minutes * IT multiplier of 0.7) = 4.9 minutes (for the early symptomatic phase) plus four hours (atropine effects). At the end of the four hours, someone could again inject him with atropine to extend the time by another four hours, with no time lost on the early symptomatic phase.*

The release of acetylcholinesterase is usually done at advanced medical facilities. It involves the breaking of the nerve agent-enzyme bond through the use of chemical reactivators. The dosage of reactivator must be carefully calculated, and the progress of the casualty monitored. If the

technique is successful, the nerve agent is neutralized. Reactivator therapy is considered an antidote.

Designation: GA
Common Name: Tabun
Chemical Name: Ethyl-N-dimethylphosphoramide-cyanate
Toxic by: Skin Absorption
Persistent: Yes. PM = 1.5
Odor: Very faint sweet fruity smell.
Asymptomatic Period: 10 Phases
Early Symptoms [15 Minutes]: Runny nose, difficulty breathing, feeling of tightness in the chest. Vision is blurred and dim. These progress rapidly to coughing, drooling, and muscle twitches. Excessive sweating also occurs.
Advanced Symptoms [40 + (10) Minutes]: Strangling tightness in the chest. Vomiting. Cramps. Muscle tremors. Involuntary urination and defecation. These progress to include collapse, convulsions, and finally paralysis.
Treatment: Antidote. Relieve symptoms. Decontamination.
HT: 28 Days
Notes: Acetylcholinesterase inhibitor. Tabun was the first nerve agent synthesized by the Germans in preparation for World War II. There were some 12,000 tons produced, but never used. Presently, Tabun is no longer stockpiled among western CW-capable nations, but is still expected to be held in inventories by the Soviet Union. Finally, Iraq possesses Tabun, having used it in the Iran-Iraq war. As Tabun is the easiest of the nerve agents to produce, it is expected to be developed by nations just starting a CW program. Tabun is also available in a non-persistent form.

Designation: GB
Common Name: Sarin
Chemical Name: Isopropylmethylphosphonofluoridate
Toxic by: Skin Absorption
Persistent: Yes. PM = 1.2
Odor: None
Asymptomatic Period: 10 Phases
Early Symptoms [10 Minutes]: Runny nose, difficulty breathing, feeling of tightness in the chest. Vision is blurredand dim. These progress rapidly to coughing, drooling, and muscle twitches. Excessive sweating also occurs.
Advanced Symptoms [25 + (10) Minutes]: Strangling tightness in the chest. Vomiting. Cramps. Muscle tremors. Involuntary urination and defecation. These progress to include collapse, convulsions, and finally paralysis.
Treatment: Antidote. Relieve symptoms. Decontamination.
HT: 28 Days
Notes: Acetylcholinesterase Inhibitor. Sarin was first developed by the Germans, shortly after they developed Tabun. Sarin is still stockpiled in quantity by the United States, but is expected to be supplanted by VX-class agents. The Soviet Union is also expected to stockpile Sarin, and is said to have aided the CW-program of Iraq to the extent that Iraq is expected to be capable of producing Sarin and may even be stockpiling it. Sarin is also available in non-persistent form and in a binary form to the United States.

Designation: GD
Common Name: Soman
Chemical Name: Pinacolylmethylphosphonofluoridate
Toxic by: Skin Absorption
Persistent: No

Odor: None
Asymptomatic Period: 10 Phases
Early Symptoms [7 Minutes]: Runny nose, difficulty breathing, feeling of tightness in the chest. Vision is blurred and dim. These progress rapidly to coughing, drooling, and muscle twitches. Excessive sweating also occurs.
Advanced Symptoms [15 + (10) Minutes]: Strangling tightness in the chest. Vomiting. Cramps. Muscle tremors. Involuntary urination and defecation. These progress to include collapse, convulsions, and finally paralysis.
Treatment: Antidote. Relieve symptoms. Decontamination.
HT: 28 Days
Notes: Acetylcholinesterase Inhibitor. Soman is a highly toxic nerve agent, which is reported to be three times as toxic as Tabun. It is not a common agent, having been replaced by the VX and VR-55 in the United States and the Soviet Union respectively. Soman is not expected to be stockpiled. Soman is also available in a non-persistent form.

Designation: VX
Common Name: VX or "Thickened Soman"
Chemical Name: Ethyl S-dimethylaminoethyl methylphosphonothiolate
Toxic by: Skin absorption
Persistent: Yes. PM = 2
Odor: None
Asymptomatic Period: 10 Phases
Early Symptoms [7 Minutes]: Runny nose, difficulty breathing, feeling of tightness in the chest. Vision is blurred and dim. These progress rapidly to coughing, drooling, and muscle twitches. Excessive sweating also occurs.
Advanced Symptoms [15 + (10) Minutes]: Strangling tightness in the chest. Vomiting. Cramps. Muscle tremors. Involuntary urination and defecation. These progress to include collapse, convulsions, and finally paralysis.
Treatment: Antidote. Relieve symptoms. Decontamination.
HT: 28 Days
Notes: Acetylcholinesterase Inhibitor. VX was first developed in the United States in 1955 and has been stockpiled by the United States since that time. Recently, however, VX has been stockpiled in binary form. Binaries are a development of chemical agent technology which allows nerve agents to be stored as two somewhat less toxic chemicals. The two chemicals are mixed when the bomb is released or the shell is fired, thus producing VX. The United States is expected to be the sole possessor of VX.

Designation: VR-55
Common Name: Thickened Soman
Chemical Name: Believed to be soman thickened by the addition of synthetic polymers.
Toxic by: Skin absorption
Persistent: Yes. PM = 1.9
Odor: None
Asymptomatic Period: 10 Phases
Early Symptoms [7 Minutes]: Runny nose, difficulty breathing, feeling of tightness in the chest. Vision is blurred and dim. These progress rapidly to coughing, drooling, and muscle twitches. Excessive sweating also occurs.
Advanced Symptoms [15 + (10) Minutes]: Strangling tightness in the chest. Vomiting. Cramps. Muscle tremors. Involuntary urination and defecation. These progress to include collapse, convulsions, and finally paralysis.
Treatment: Antidote. Relieve symptoms. Decontamination.
HT: 28 Days

Notes: Acetylcholinesterase Inhibitor. VR-55 was probably developed in 1955 by the Soviet Union. It is their main nerve agent, and only they and their primary allies are expected to stockpile it. VR-55 was allegedly used by the Egyptians during their intervention in Yemen.

Biological Toxins

Biological toxins are inanimate chemicals naturally produced by living organisms as either defence chemicals or a natural by-product of organic functions. They are presently a matter of grave concern in the defence community because of allegations of their use by the Soviet Union in Laos against the Hmong hill people.

Originally, biological toxins had very little military application, and were primarily used as poisons for assassinations, murders, and suicides. Their use in a conventional CW role was not fully explored until after World War II, and was driven primarily by intelligence agencies wanting better assassination techniques.

The research exploded into a worldwide controversy in 1981, when the United States alleged that the Vietnamese (with Soviet assistance) had used chemical weapons against Hmong and Khmer Rouge tribespeople in Laos and Cambodia since at least 1978, and possibly as early as 1975. One of the weapons allegedly used was Yellow Rain, supposedly a mixture of trichothecene mycotoxin and other chemicals, which was designed to cause massive hemmoraging and death. Similar reports started filtering out of Afghanistan, where "Yellow Rain" was said to be found on a Soviet gas mask. Refugee reports and interviews have revealed that there are at least three types of chemicals being used and are identified by the cloud colors yellow, white, and green. These agents and their alleged effects are discussed below.

Whether yellow rain actually exists or not, or whether it was actually used has never been resolved. Laboratory tests have proved inconclusive, with trichothecenes being found in some samples and not in others, and sufficient problems have arisen in control tests to cast doubt on the validity of both successful and unsuccessful tests. Sampling procedures and interviews with refugees have had their validity questioned, and alternative theories have been proposed, including natural fungal growths and bee defecations. The debate at present is of a highly speculative nature, and reflects a lack of incontrovertable evidence. Note: For the purposes of these rules only, Yellow Rain and its companions are treated as if they did exist.

Since the development of the Yellow Rain debate, another potential use of biological toxins has come to light. Terrorists may make use of such toxins in direct attacks on civilian targets, such as water and food supplies. In November 1980, a raid on a Paris safehouse of the West German Red Army Faction uncovered a bathroom lab containing Botulin, and in 1984, two Canadians using false credentials ordered tetanus and botulism cultures from a Maryland research firm. These incidents seem to show that terrorists are quite mindful of the potential for toxin warfare against their selected targets.

Designation: None
Common Name: Botulin
Chemical Name: Botulinal Toxin A
Toxic by: Ingestion
Persistent: Yes. PM = 0.5
Odor: None
Asymptomatic Period: 12 * (3) Hours
Early Symptoms [1 Day]: Nausea, weakness/paralysis starting at eyes and throat and moving down the body, dizziness, headache, and blurred vision.
Advanced Symptoms [6 + (3) Days]: Respiratory difficulty which may develop into viral pneumonia (40% chance).
Treatment: Antidote, relieve symptoms.
HT: 30 Days, but respiratory difficulty remains for up to 1 year.
Notes: The most lethal toxin known. As little as 0.1 mL of contaminated food can kill. One

mouthful delivers (6) standard doses. 1 pound of contaminated food delivers up to 200 standard doses. The agent is normally created by Botulism
spores which infect improperly preserved food. The storage containers may appear to bulge at the sides and top and may even explode.
Such a substance would have very little use dispersed through military means, unless it were released into the food or water supply of a nation or city. Terrorists, such as the West German Red Army Faction, have already apparently discovered
the value of Botulin, as they were captured by French police in November, 1980 with a bathtub filled with botulism culture.

Designation: None
Common Name: Staphylococcal Toxin
Chemical Name: Staphylococcal Enterotoxin A
Toxic by: Ingestion
Persistent: Yes. PM = 0.5
Odor: None
Asymptomatic Period: (2) + 1 Hours
Early Symptoms [1 Day]: Nausea, vomiting, abdominal cramps, severe diarrhea with mucus or blood.
Advanced Symptoms [1 Day]: Continued.
Treatment: Relieve Symptoms at 1/2 normal effectiveness.
HT: 1 Day.
Notes: A mild form of food poisoning. One infected meal will provide (2) standard doses of agent, and one pound of contaminated food will provide roughly 3 standard doses. This toxin comes from a bacteria which usually infects dairy
products but can infect other foods. The toxin is heat-stable, meaning it cannot be destroyed by cooking. Like Botulin, staphylococccus enterotoxin is a potential
terror weapon which can be used to harass a food distribution network. For example, contaminating food at a restaurant or at a dairy plant can cause the entire network to be shut down as inspectors try to track the source of the toxin.

Designation: Oudushayshe ?
Common Name: Yellow Rain
Chemical Name: Believed to be a mixture of Trichothecene Mycotoxins (specifically T-2 or HT-2) and other chemicals.
Toxic by: Skin Absorption. Ingestion.
Persistent: Yes. PM = 1
Odor: "Bad smell"
Asymptomatic Period: 10 Minutes
Early Symptoms [3 Days]: Severe skin rashes--almost like blistering. Rash itches severely. Headaches. Tearing.Runny nose. Blurred Vision and disorientation. Swollen lungs causing difficulty breathing.
Advanced Symptoms [9 Days]: Diarrhea. Severe coughing of blood. Nausea. Vomiting. Severe body pain. Internal bleeding.
Treatment: Wash. Relieve symptoms. Antidote?
HT: 14 Days, but effects may linger for up to a month. Scars may remain even longer.
Notes: The actual existence of Yellow Rain is still being debated with no incontrovertable evidence yet having come to light. Much of what evidence there is suggests that Yellow Rain is a trichothecene mycotoxin believed to be derived from Fusarium fungus, the existence of which in Southeast Asia has not been established or disproven.
The above symptoms are taken from Hmong military and refugee reports in 1981 and 1982. These reports state that villages were sprayed with "clouds" of wet, yellow material which dried to a yellowish dust. Fourteen days after the spraying, 30% of the

contaminated plant life turned yellow and died. The actual
spraying was done either by aircraft or airburst rockets, and some reports suggest that yellow rain is binary in nature, with the two components being combined in mist form after spraying. Allegations place the dead from this and the related
rains at 7000 Laotians and Cambodians and 3000 Afghans. The name "oudushayshe" is taken from testimony of Anatoly Sakharov, a Soviet defector in Afghanistan. It may or may not refer to yellow rain--the name suggests that it refers to a choking or asphyxiating agent.
The existence of an antidote is unknown.

Designation: Smirch ?
Common Name: "White" Rain
Chemical Name: Believed to be a mixture of Trichothecene Mycotoxins (specifically T-2 or HT-2) and other chemicals.
Toxic by: Skin Absorption
Persistent: Yes. PM = 1
Odor: Unknown. Possibly a "bad smell"
Asymptomatic Period: 10 Minutes
Early Symptoms [30 Minutes]: Severe Headaches. Blurred vision. Disorientation/tiredness. Coughing.
Advanced Symptoms [2 Hours]: Massive internal and external bleeding leading to vomiting of blood and diarrhea with blood simultaneously. Blood-stained urine. Severe coughing, also with blood. In some lethal cases, the heart and lungs are ruptured.
Treatment: Wash. Relieve symptoms. Antidote?
HT: 21 Days, but effects may linger for up to 2 months.
Notes: White rain is often confused with Yellow Rain. White rain's existence is also disputed, but reports suggest that it is a more lethal form of yellow rain. It causes very rapid,painful death. Plants are also killed almost immediately.
Like yellow rain, the name is also provided by Sakharov's testimony, and may not even refer to white rain. "Smirch" is said to be 100% fatal, and the effects of white rain suggest that Smirch is the appropriate designation. The existence of an antidote is unknown.

Designation: Unknown
Common Name: "Green" Rain
Chemical Name: Unknown. Judging from effects, this agent may be related to Yellow and White rains and may be mycotal in origin.
Toxic by: Inhalation
Persistent: Yes. PM = 0.5
Odor: Floral/Perfume scent
Asymptomatic Period: 20 Minutes
Early Symptoms [4 Days]: Blurred vision, general numbness. Disorientation and confusion causing incapacitation. Difficulty breathing.
Advanced Symptoms [4 Days]: Continued.
Treatment: Wash. Relieve Symptoms. Antidote ?
HT: 7 Days.
Notes: Incapacitant, possibly psychotomimetric. It is expected to be lethal in higher concentrations. Like both Yellow and White rain, the existence of Green rain is disputed. The existence of an antidote is unknown.

Defoliants

Defoliants are unlike other CW weapons in that they do not directly attack troops. They are essentially herbicides designed to either selectively kill certain types of vegetation or non-selectively kill all vegetation in an area where the chemicals have been applied.

The primary use of defoliants is to cause leaves to fall off trees and thus deny the enemy the use of the trees as camo- flage. This was the primary justification for the use of defoliants by the United States in the Vietnam War. A secondary, less publicized use is to use defoliants to attack food sources of enemy populations. This was done to a certain extent in Vietnam by the United States, but was not as common as defoliation missions.
The defoliants were first used by the United States in 1962 in Operation Ranch Hand, which involved the use of herbicide spraying from aircraft. Ranch Hand had only defoliation as an objective until 1964, when the United States became fully committed to the war. At that point, the use of herbicides for crop destruction was authorized. Operation Ranch Hand lasted from October, 1962 to January, 1971, and sprayed six million acres of South Vietnam in that time. The adverse publicity surrounding the use of defoliants and the allegations of health risks meant that the United States never used defoliants since. Also, no other nation is believed to have used defoliants either.

Defoliant Effects on Humans:
The studies of defoliant effects on humans are inconclusive. They are unable to show that defoliants applied in battle- field conditions have any effect on a human.

However, the evidence of Vietnam War veterans and civilians in that war suggests that there are both immediate and long-term effects of exposure to defoliants. A combatant sprayed with a defoliant at "battlefield concentrations" will suffer minor skin irritation and itching immediately following exposure, and may develop a rash which fades after a few days. Neither the irritation nor the rash will in any way affect his abilities as a combatant.
However, numerous long-term effects have been alleged. These are primarily attributed to Agent Orange, which saw the most application in Vietnam, but they may apply to the other defoliants as well. In the long term, the exposed combatant may develop respiratory distress, behavioral changes, or cancer. Also, his or her children may suffer from birth defects such as limb malformation and (more commonly) congenital respiratory and heart defects. In very rare cases, the child may be stillborn and horribly deformed. It is expected that such dramatic effects would only occur after prolonged exposure.

Defoliant Effects on Plants:
On plants, however, the effects are substantially differ- ent. Three primary defoliants are listed below along with their effects on plant life. The gamemaster should determine the swath sprayed by the delivery aircraft and apply these effects to the plant life covered by the swath. For simplicity, do not consider CNC values of the spray, provided that the players use a "reasonable" spray pattern.

Designation: Agent Orange
Common Name: 2,4-D plus 2,4,5-T
Chemical Name: Mixture of 50% 2,4 Dichlorophenoxyacetic Acid and 50% 2,4,5 Trichlorophenoxyacetic Acid
Effects: Swath is characterized by plant life which has gone on a wild growing spurt and undergone dramatic leaf fall. Not a leaf will remain on the affected trees. Affects only the uppermost canopy of a forest, and only kills those trees. Saplings and shorter trees which are covered by the canopy remain unaffected. Mangrove trees and swamp plants are killed outright, and may take up to a decade to begin regeneration. Crops are killed outright. Bamboo seems unaffected.
Time for Effects to be Noticed: 3 Days to substantial leaf fall. After a week, the affected trees and crops are dead.
Time for Recovery: Variable, depending on location and type of plants sprayed. In a rapidly growing forest or jungle, the effects may persist for up to a month with one spraying, and up to three months with two sprayings. Three or more sprayings will last for

up to two years as the growing cycle is interrupted. Longer effects may persist because of soil erosion or the incursion of grasses or bamboo.
Notes: Defoliant. Agent Orange was the primary defoliant used in the Vietnam War and was used to control jungle growth and attack crops. It works by first interfering with the production of the hormone auxin in plants, which is necessary to have strong cells where the leaf and stem connect. Secondly, Agent Orange causes an acceleration in growth, which has the effect of making the leaves heavier than the auxin-lacking connector cells can hold, and thus accelerating leaf fall. The plant dies shortly after.
Agent Orange is actually a mixture of commercially available herbicides. The name Agent Orange comes from the color of the metal barrels the United States military used to contain the agent. Agent Orange is interchangeable with Agent Purple, which has different proportions of the herbicides.

Designation: Agent White
Common Name: Tordon 101
Chemical Name: Mixture of 2,4-D and 4 amino 3,5,6 trichloropicolinic acid (a.k.a. Picloram)
Effects: The swath of trees is killed, and the leaves are removed. Affects only the uppermost canopy of a forest, and only kills those trees. Saplings and shorter trees which are covered by the canopy remain unaffected. Mangrove trees and swamp plants are killed outright, and may take up to a decade to begin regeneration. Coniferous trees and crops are killed outright. Bamboo seems unaffected.
Time for Effects to be Noticed: 3 Days to substantial leaf fall. After a week, the affected trees and crops are dead.
Time for Recovery: Variable, depending on location and type of plants sprayed. In a rapidly growing forest or jungle, the effects may persist for up to 3 months with one spraying. Two or more sprayings will last for up to two years as the growing cycle is interrupted. Longer effects may persist because of soil erosion or the incursion of grasses or bamboo. Also, Agent White is highly persistent, so growth in a sprayed area may be stunted or otherwise retarded for years after the spraying.
Notes: Herbicide. Agent White is designed for use around settlements because of its lower tendency to drift than Agent Orange. In Vietnam, it was primarily used for woody plant control, and was used on coniferous forests. Like Agent Orange, Agent White is a commercially available herbicide. Agent White's method of operation is to kill the plant outright in addition to halting the production of auxin.

Designation: Agent Blue
Common Name: Cacodylic Acid
Chemical Name: Dimethylarsenic acid
Effects: The swath of grass, crops, and bamboo is killed.
Time for Effects to be Noticed: 3 Days to grass kill.
Time for Recovery: Variable. Agent Blue is expected to be quickly inactivated after application, but this does not apply to cropland. Sprayed areas will not support crops for up to 2 years. Grass and bamboo may start regenerating after 3 weeks.
Notes: Herbicide. Agent Blue was used for grass and crop control in Vietnam. Like the other agents, Agent Blue is commercially available, but has been out of use since the 1970s in North America because of fears of long-term effects.

Send comments.

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Biological Warfare Agents

The use of biological agents in warfare has been in existence since the time of the well poisoners in ancient Greece and Rome. Only in modern times has Biological Warfare (BW) become a concept which has frightened those who understand the ramifications. Their contagiousness and reproductive abilities, the very features which makes biological agents effective, also make them highly uncontrollable and likely to attack the users as well as the targets. One only has to consider the spread of HIV and Ebola from Central Africa to every nation of the world to understand how uncontrollable a disease organism can be. BW is essentially the intentional release of disease organisms into the atmosphere and those organisms' spread can be just as dramatic.

The rules in this chapter consider biological agents which have been examined by modern military forces and provides data on their application and symptoms. The agents are broken down into viral, rickettsial, bacterial, and mycotal agents.

- Biological Weapons
- Administration of Biological Agents
- Infection and Disease Rules
- Viral Agents
- Rickettsial Agents
- Bacterial Agents

Biological Weapons

The term biological weapon refers to a means of attack where the offensive item is a biological agent. Biological agents are living organisms which are intended to cause diseases or death in human, animal, or plant life. They are organisms which are highly contagious and rely on this and their ability to reproduce to maintain their impact on a targeted population. This makes the agents strategic weapons, and they are quite capable of devastating entire cities or nations with their effect being limited only by how much contact the infected have with the rest of the population. In many of these agent's cases, medical science does not allow anything more than therapy of symptoms, there being no therapy to treat the agent itself. In such cases, human and animal targets must rely on their own immune systems to combat an infection, and often, the immune system is simply inadequate.

Modern Background:
Research into the nature of disease organisms in the ninteenth century brought forward the idea among militaries that bacteria and other agents could be controlled and used as a means of attacking an enemy. The ability to control such agents, and use them to attack enemy troops was an appealing one, for disease at the time was more lethal than any other weapon. Prior to the twentieth century, disease had been a factor among militaries on campaigns and more troops had died of disease than of enemy steel and fire.
Advances in firearms during the late ninteenth century made disease a less prominent feature on the battlefield, and it was not until firepower bogged down in the muddy trenches of World War I that the idea of alternative weapons such as chemical and biological agents was seriously considered.
Biological weapons were not used in that war, and in 1925, the Geneva Protocol, recognizing the danger of "alternative weapons," banned the use of bacterial agents. Despite the protocol, research into such weapons continued.
During World War II, the British, in cooperation with the Americans and Canadians tested bacteriological and chemical weapons. One of the weapons systems tested was anthrax, code named Agent N, which was placed into bombs which were dropped from cranes on Gruinard Island, just off the coast of Scotland. The testing has contaminated the island's soil with anthrax, and the island remains under quarantine to this day. In Europe, the Nazi governement of Germany was conducting horrible medical experiments on concentration camp prisoners, including exposing them to potential BW agents.
On the other side of the world, the Japanese were testing biological agents on prisoners of war. The Japanese Unit 731 was officially titled the "Kwantung Army Anti-Epidemic Water Supply and Purification Department", but its real purpose was to experiment with bacteria as weapons of war. At least 3000 prisoners of war, ranging from Chinese to Soviet to American, were exposed to biological agents, and more than 1000 of those prisoners died as a result. Also, there are reports that Unit 731 was involved in the release of anthrax and paratyphoid (not listed) bacteria on eleven Chinese cities between 1940 and 1944.

Following the war, captured members of Unit 731 were brought to the United States and offered amnesty in return for their researches. This began a more intensive research program by the United States into the potentials of BW. Agents were developed and stockpiled by the United States and the United Kingdom, and quite likely by the Soviet Union as well, although the Soviet government has always denied ever possessing BW agents or munitions.
Then, in 1972, these three nations signed the Biological Weapons Convention, which banned all stockpiling of biological agents and biological toxins and their delivery systems. There are at least 100 other signatory nations to this document.
Though there have been allegations that major superpowers are violating the agreement, there is no incontrovertable evidence to support the allegations. The United States points to the Soviet Union's sudden outbreak of anthrax at Sverdlovsk in 1979 as being a BW accident and the reports of Yellow Rain (See Section 2.8) as being evidence of a BW capability. Conversely, the Soviet Union points to the United States' continued research into these agents as evidence of development of a BW capability. Despite these allegations, at present, no nation is expected to possess stockpiles of biological agents for use in a future military conflict.
This does not preclude the use of biological agents as terrorist weapons. The chapter on Chemical weapons has already mentioned the 1980 raid on a West German Red Army Faction safehouse which uncovered a bathtub of botulism culture, and the 1984 efforts of two Canadians to acquire botulism and tetanus culture from a Maryland research facility. These two incidents underscore the potential for use of biological agents by terrorist forces.

At present, the great fear of medical researchers is the potential genetic engineering offers to BW research and development. Although genetic engineering can be used to develop effective vaccines and treatments against many diseases, the risk is that it may be used to make BW agents more lethal or make them more selective. A possible development in BW using genetic

engineering is the creation of an ethnic disease, a weapon that attacks only targets of certain racial/genetic characteristics. These are only two of the possibilities which make the future of BW a frightening
one.

Administration of Biological Agents

Biological agents use identical methods and munitions as chemical agents. However, the nature of the biological agents upon release and infection varies tremendously from chemical agents.

This section provides rules for resolving contamination and dispersal effects of biological agents.

Active Period:
A biological agent upon release passes through an active period during which time it can contaminate and infect its targets without requiring a host body to survive. The active period is listed below for aerial and water release:

Active Period

Agent Type	Aerial	Water
Virus	36 hrs	7 days
Rickettsia	48 hrs	7 days
Bacteria*	4 days	15 days
Fungi	4 days	4 days

* Note that anthrax can survive in spore form indefinitely by infecting the soil. Normally, such a case would require heavy bombardment--a single weapon would be insufficient to cause such contamination. Under heavy anthrax bombardment, the
contaminated zone is deemed permanently contaminated.

Contamination: Aerial Release
Aerial release methods include groundbursts, aerial spraying, and projectors, and are usually military biological munitions. They are release methods which characterize popular conceptions of biological warfare (BW).

Aerial release methods work by introducing the biological agents into the atmosphere in an aerosol form, much like common chemical chemical agents. When an aerial release munition discharges, it produces a cloud of the agent which proceeds to move downwind at the wind speed and will continue to do so for the full length of the active period. Any area which has been touched by the cloud is contaminated as long as the active period has not elapsed.
Any unprotected person or animal inside a contaminated area during the active period runs a chance of being infected. The contaminated area is deemed to be non-contaminated at the end of the active period.

Contamination: Water/Food Release
A less common concept of BW is the use of biological agents to contaminate water or food supplies of targeted populations. It is a very slow, but effective method of attacking a city population or attacking the export/agricultural economy of a nation. By simply introducing the agent into a city's water supply, an attacker could have the agent delivered to his target's kitchen faucet. Modern urban-water supply filtration systems will normally pick out harmful biological agents (and even chemical agents) to prevent such an attack, but if the agent were introduced after the filtration process or if there was no filtration system in place, the effects on the city

population would be devastating. The mere hysteria among the targeted population could be as devastating as the effects of the agent.

Also, the introduction of biological agents into food supplies, like grain bins, livestock, processing plants, supermarkets, or restaurants can have similar devastating effects. If biological agents were introduced into imported food shipments prior to inspection, and then discovered, all shipments from the exporter nation to the inspecting nation would stop, causing tremendous harm to the exporter's economy.

The foregoing are reasons why terrorist groups view biological attack through water and food supplies as valuable weapons. Such attacks allow them to target city populations or national economies in a highly effective, yet inexpensive manner.
Biological agents released into water or food supplies behave quite differently than aerial-release weapons. A water-released agent will spread through the entire water system. A food-released agent will not spread and will have an active period equal to the aerial-released active period. Any person ingesting the water or the food during the active period will be exposed to the biological agent and may become infected.

Vectors:
Because the active period has elapsed in a contaminated area does not mean that the area is safe. People and animals can still become infected if they are exposed to vectors.

Vectors are sources of infection which have been established by the biological agent. What has happened is the agent has infected a person, an animal, or even the soil, and the agent can then travel from that Vector to attack an uninfected target using its normal method of transmission. The Vector will remain active until cured, treated, or destroyed. For example, the British experimented with anthrax bombs on Gruinard Island off the coast of Scotland and contaminated the island's soil with anthrax. Though the island is quarantined, thus preventing the infection from spreading, the vector--the contaminated soil--is still dangerous, even fifty years later.

Any person or animal which was infected by the original biological agent cloud or through transmission of the disease from another vector becomes a vector. Soil will almost never become a vector because the required amount of agent to which the soil must be exposed is enormous. Gruinard Island's soil became a vector only after repeated bombing with anthrax.

Infection and Disease Rules

The effects of biological agents on characters are determined in three steps: infection, symptoms, and treatment.

STEP 1: INFECTION
A character can become infected in two ways. Either he is infected by being in the area contaminated by a biological agent cloud while the cloud is still active, or he can be infected by exposure to a vector.

Infection via Contamination:
If a character is exposed without protection to contamination during the active period, he must make a 00-99 roll against the Contraction Number. If he rolls over the contraction Number, he avoids being infected. How the disease is normally transmitted (TRX) does not apply in this situation.

Infection via Vectors:
If the character is exposed a vector, the gamemaster checks the Disease Tables to find out how the disease is transmitted (TRX). If the character has been in any of those situations while

exposed to the vector, the gamemaster then rolls 00-99 to determine if the character contracts the disease. If the roll is greater than the Contraction Number, the character has managed to avoid being infected.

Rolling Under the Contraction Number:
If in either of the above cases, however, the roll is less than or equal to the contraction number, the character becomes infected and contracts the disease, and the gamemaster proceeds to the next step--symptoms. The character will never know that he has been infected until the symptoms manifest themselves. For this reason, the gamemaster should make the contraction roll in secret.

Contraction Number:
The contraction number is calculated by taking the disease's Contraction Chance (CTC) and subtracting the character's current HLT score. Any fractions in the HLT score are rounded off to the nearest whole number.

Contraction Number = CTC - Current HLT

> ***Example:*** *Niki gets caught in an anthrax-contaminated area after the active period has elapsed, so she is safe from infection that way. However, she comes across a dead soldier and removes her mask to examine him. The dead soldier is a vector for the anthrax used in the attack, and Niki has just contaminated herself by taking in his airborne anthrax particles. The gamemaster secretly rolls 00-99 and rolls a 35. The CTC of Anthrax is 75 minus Niki's HLT of 14 = 61. Since the roll is under the Contraction Number, Niki has contracted anthrax.*

Methods of Transmission:
Disease transmission through contact with bodily fluids requires that the infected fluid must enter the victim's body in some way. This can include bites, blood transfusions, infected needles, oral contact (such as a kiss), or sexual intercourse unless otherwise specified. Transmission through bites only occurs if the bite breaks the skin. The bite must pass through any clothing and the skin itself before the disease-carrying saliva of the can enter the victim's body. Bites will not penetrate boot-thick leather or any type of armor. The same applies to infected needles.

Disease transmission through airborne particles means that any characters in the proximity of the disease source run the risk of becoming infected. Characters who use air-filtration gear or have an independent air supply are not at risk provided that they decontaminate their clothing prior to removing the air filtration gear. The airborne particles can attach themselves to clothing and later be inhaled by the wearer.

Disease transmission through contaminated food and water only occurs if the characters actually ingest the food or water. Note that this applies even to food obtained or prepared in a settlement.
Disease transmission through contact or contact with infected feces occurs in two stages. The contact itself is harmless, but the character's skin is contaminated. If the contaminated skin comes into contact with a cut on the skin, membranes in the nose, eyes, or mouth, or by contaminating food or water the character ingests, then the character has a chance of contracting the disease.
Disease transmission through flies, fleas, or body lice occurs when the character is in close proximity with the insects. Only an isolation suit that is decontaminated prior to being removed will prevent the insects from passing on their diseases.

STEP 2: SYMPTOMS
Symptoms progress through three phases: incubation, early symptoms, and advanced symptoms. During any of these times, the progress of the disease can be arrested by making a

Disease Recovery Roll (DRR). This is calculated by taking the RR value of the disease and subtracting the character's current HLT score as well as any modifiers for treatment. If a 00-99 roll is lower than this number, the progress of the disease is arrested. Otherwise the disease continues to the next phase.

DRR = RR + HLT + (Treatment Modifiers)

A DRR can only be made once at the end of each symptomatic phase.

Incubation Period

All diseases pass through an incubation period (IP). During this time, there are no symptoms, and the disease cannot be diagnosed by any medic. However, medics can initiate a program of treatment if they suspect that the circumstances would mean that a disease has been contracted. An example of such a situation would be an animal bite, where the animal was shown or suspected to be infected with a disease. If a DRR indicates that the disease is arrested in the incubation period, then there are no further ill effects.

> ***Example:*** *Niki contracted anthrax in the last example, and has been undergoing the Incubation Period unaware of any problem and has not had any treatment. The Incubation Period lasted (random roll of 3 on a (5) =) 3 days. At the end of the third day, the gamemaster makes a DRR for her. He determines her DRR to be an anthrax RR of -10 plus her HLT of 14 for a DRR of 4. The gamemaster rolls a 72 on a 00-99 and determines that she advances to the early symptomatic phase of the disease.*

Early Symptomatic Phase

If the disease is not arrested during the incubation phase, the early symptoms begin at the end of the IP. These symptoms will usually debilitate the character and prevent him from engaging in any activity other than resting. A character is treated as being fatigued during this time in addition to suffering from the associated Early Symptoms. The early symptoms last for the amount of time indicated in the brackets.

A medic can attempt to make a diagnosis of the disease based on the symptoms by making a medical skill test (Base Odds = 7). Failure means that he misdiagnoses the disease and he will believe it to be a disease listed under Differential Diagnosis of the disease descriptions. If there is no differential diagnosis listed, then the medic simply cannot identify the disease.

As an alternative, the gamemaster can hand the disease descriptions to the player of the medic character and let him figure out what the disease is based on the description of the symptoms.

A DRR can be made at the end of the early symptomatic phase and if successful, the disease is arrested during this period and the character suffers a debility period equal to the listed Healing Time (HT). During this time, the character is treated as being fatigued. The fatigue associated with the disease is removed at the end of the HT. If the DRR is failed, the disease progresses to the advanced symptomatic phase.

> *Example: Niki, in the early symptomatic phase of anthrax, has been feeling fever and malaise and having labored breathing and coughing. On the first day of the symptoms, the medic attempts to diagnose the problem and rolls a 12 on a 3(6), thus exceeding the needed base odds of 7 plus his own SL of 3. The medic has no idea what the problem could be, but attempts to relieve her symptoms anyhow and confines her to bed. After 3 days, Niki must make another DRR. Since she has not received the treatment required, her DRR remains at RR of -10 plus HLT of 14 for a 4. She rolls a 23 and fails again. She advances to the advanced symptomatic phase.*

Advanced Symptomatic Phase

During the advanced symptomatic phase, the early symptoms continue and the advanced symptoms are added to the character's list of sufferings. These symptoms last for the amount of time listed in brackets. At the end of this time, a final DRR is allowed. If this DRR is failed, the character dies of the disease. If, however, the DRR is successfully rolled, then the character suffers debility for the HT as he would for the early symptoms.

> ***Example:*** *In the advanced symptomatic phase of her anthrax, Niki's symptoms have become much worse. The medic, in desperation, tries a broad-spectrum antibiotic as treatment. After 5 days, Niki makes her final DRR. This time, it is an RR of -10 plus Niki's HLT of 14 plus 30 for the antibiotic therapy for a 34. Niki rolls a 17 and survives the disease. She now suffers a debility of 5 days before she is fully recovered. Had she failed this DRR, she would have died at the end of the advanced symptomatic phase.*

STEP 3: TREATMENT

The progress of a disease can be arrested through the application of the proper treatment. Each disease has a list of appropriate treatments and only those treatments listed will be effective in combatting the infection. Short descriptions of the various types of treatment are given below. The listed treatments can be used in conjunction with one another.

The effectiveness of treatment varies with the phase of the disease. Each description has a series of effectiveness ratings given in parentheses after the title. The series consists of three numbers separated by slashes. The first number is the effectiveness of the treatment being applied during the incubation period. The second gives the effectiveness of the treatment if it is applied during the early symptoms phase, and the final number is the effectiveness of the treatment if applied during the advanced symptoms phase.

Treatments:

Antibiotics (5/15/30)
This is a program of pharmaceuticals given to the patient. The pharmaceuticals can either be in pill or injection form. These antibiotics are deemed to be broad-spectrum, meaning that one antibiotic type will be effective against all diseases listed.

Restore Fluids (0/5/10)
The restoration of fluids ensures that the patient is not dehydrated by vomiting or excessive sweating. In most cases, this treatment is simply regularly giving the patient something to drink, but in more severe cases, intravenous fluids are used.

Relieve Symptoms (0/10/20)
The relief of symptoms is the use of pharmaceuticals or physical means to alleviate the patient's pain or to lower his fever.

Rest (0/5/10)
Rest means bedrest and sleep. The patient cannot perform any work if this treatment is to be applied. If he does, then any benefit gained from the treatment is lost.

Vaccine (90/65/10)
The vaccine treatment is the injection of a weakened form of the virus into the patient's body in order to build up a resistance to the disease by the body's immune system. Each vaccine is specific to one disease and there is no broad-spectrum vaccine available. There are, however, mixtures of numerous vaccines available where one mixture will protect against a variety of diseases. Note that only the diseases with vaccine listed can

use this treatment.

SPECIAL NOTE ON VACCINES: The most common use of a vaccine is not as a therapy after infection, but to build up the immune system to prevent infection. Vaccines will provide effective protection to a person for an average of six months following injection. They are normally administered through individual injections of killed or weakened agent into the combatant, although American researchers are expected to be working on aerosol vaccines. Aerosol vaccines would allow, for example, an aircraft to spray and thus immunize an entire city against a specific disease. If an agent has a vaccine, it will be listed in the notes accompanying the agent's description. A vaccinated population will be unaffected by the natural occurrence of the disease, but also by the intentional attacks of the disease-causing agent.

Viral Agents

Viral agents have been examined as an integral part of BW research. In many cases, they are the preferred agents because they are easy to manipulate and study, highly contagious, difficult to diagnose, and often cannot be treated except by treating the symptoms.

Viruses are organisms consisting of a protien shell encasing simple genetic material. They are normally inert except when they come in contact with a specific cell. At that point, they link up with the cell wall and inject the genetic material into the cell itself. This genetic material alters the functioning of the cell, possibly by altering the cell's own genetic code. In any case, the cell is now producing more genetic material to match that of the original virus and using the cell's own energy to do it. Eventually, the cell ruptures, releasing hundreds to thousands of new viruses. In some cases, the cell does not rupture, but reproduces itself normally, albeit with its altered genetic code.
The agents discussed in this section have been examined by militaries as potential BW weapons or have been threatened to be used as BW weapons by non-military groups.

Chickungunya Fever
Differential Diagnosis: Dengue, Malaria, Yellow fever, Influenza
TRX: Contact with insects
CTC: 75
IP: 3(4) Days
Early Symptoms [(6) Days]: Excruciating joint pain causing incapacitation. Fever. Mild headache. Anorexia and constipation.
Advanced Symptoms [6 + (6) Days]: Fever drops for (3) days, then returns at lower intensity. Rash. Continued, worsening joint pain.
Treatment: Relieve Symptoms.
RR: 70 HT: 4 Months. Joint pains can continue during HT.
Notes: Vaccine under development. Agent intended to incapacitate.

Dengue Fever
Differential Diagnosis: Malaria, Yellow Fever, Influenza, Chickungunya
TRX: Contact with insects (Mosquitoes)
CTC: 75
IP: 3 + (6) Days
Early Symptoms [4 Days]: Sudden onset of high fever and chilliness. There is severe aching of the head, back, and extremi-
ties. Sore throat. Prostration. Anorexia and constipation.
Advanced Symptoms [2 + (2) Days]: Fever drops for (2) Days, then returns. Rash appears.
Treatment: Rest. Relieve Symptoms

RR: 70 HT: 3 + (3) Weeks.
Notes: Also called Breakbone fever. A vaccine is available, but has not been commercially produced. During HT, vision problems (blurred vision) may arise and fade by the end of the HT. Agent intended to incapacitate.

Eastern Equine Encephalitis
Differential Diagnosis: Influenza
TRX: Contact with insects (Mosquitoes), contact with bodily fluids.
CTC: 65
IP: (4) Days
Early Symptoms [(2) Days]: Nausea, vomiting, headache, and fever.
Advanced Symptoms [3 + (6) Days]: After a short period of well being, the following symptoms manifest: very high fever, gastro-intestinal disturbances, convulsions, general rigidity, swelling of limbs and face, cyanosis, and drowsiness possibly leading to coma.
Treatment: Relieve Symptoms, Replace Fluids.
RR: 10 HT: 3 Weeks
Notes: Vaccine available. Common in horses and other equine animals. Agent intended to kill.

Human Immuno-Deficiency Virus (H.I.V)
Differential Diagnosis: None.
TRX: Contact with bodily fluids. Airborne particles?
CTC: 99
IP: 10(10) Months
Early Symptoms [5 + (3) Months]: H.I.V. progresses to Acquired Immune Deficiency Syndrome (A.I.D.S.). The immune system is slowly destroyed. Substantial weight loss occurs in later part. Persistent fatigue. Diarrhea. Enlarged lymph glands. Night sweats or fevers. Hairy leukoplakia--a hairy white/grey growth on the toungue.
Advanced Symptoms [3 + (3) Months]: Any or all of the following may develop:

- Pneumocystis carinii pneumonia (PCP) - Severe shortness of breath and heavy cough.
- Kaposi's sarcoma - skin cancer manifesting as purplish lumps or patches on the skin or in the gastro-intestinal tract.
- Brain Infection - confusion, disorientation, loss of concentration.

By this point, the immune system has been destroyed, and the person is highly susceptible to other communicable diseases. His HLT is effectively a -10.
Treatment: Antibiotics? Relieve symptoms
RR: -50 HT: n/a
Notes: Not a lethal virus per se, although at this point in time, H.I.V. is 100% fatal. H.I.V. attacks the human immune system and cripples it permanently. Death does not necessarily come by viral action, but through secondary infections, such as pneumonias, tuberculosis, etc. The gamemaster should use such secondary infections in determining the outcome of an H.I.V. infection. As H.I.V. is a very infectious virus, and thus possibly of military or terrorist interest, it has been included in this book. Potential applications in a BW context include water-release or poisoning a blood supply. It is also possible that the virus could be dispersed as an aerosol from a groundburst, spray tank, orprojector. Whether airborne particles could infect targets is a matter of debate. For the purposes of this book, it is assumed that such infection can occur.
No vaccine available. Agent is intended to kill.

At the time of writing, there was a great deal of speculation on the infectious nature of

H.I.V. At present, conventional medical thought is that HIV can only be trasnmitted by contact with bodily fluids.

Influenza
Differential Diagnosis: Flu virus (not listed)
TRX: Airborne particles
CTC: 65
IP: (4) Days
Early Symptoms [1 Day]: Abrupt onset of fever, chills, malaise, aches, sore throat.
Advanced Symptoms [2 Days]: All early symptoms get progressively worse.
Treatment: Relieve symptoms, rest, replace fluids.
RR: 10 HT: 2 Days
Notes: Influenza is a very serious and often lethal disease that often appears in epidemics. Making it even more lethal is a 20% chance of the patient developing Viral Pneumonia after the HT is completed. Vaccine available. Agent is intended to incapacitate.

Smallpox / Variola
Differential Diagnosis: Chickenpox or Herpes Zoster (not listed)
TRX: Contact.
CTC: 85
IP: 7 + (10) Days
Early Symptoms [1 + (3) Days]: Chills, fever, headaches, lumbar pain, vomiting.
Advanced Symptoms [7 Days]: Fever falls on first day and a rash appears on face and extremities.
Treatment: Vaccine. Relieve Symptoms. Replace Fluids.
NOTE: QUARANTINE ALL PERSONS THOUGHT TO BE INFECTED.
RR: 20 HT: 4 Weeks
Notes: Believed to have been eradicated by vaccination by the World Health Organization in 1979. Vaccine exists. Agent is intended to kill.

Venezuelan Equine Encephalitis
Differential Diagnosis: Influenza
TRX: Contact with insects, contact with bodily fluids,
airborne particles.
CTC: 65
IP: 2 + (3) Days
Early Symptoms: [2 Days] Abrupt onset of fever, chills, malaise, aches, sore throat.
Advanced Symptoms: [(3) Days] All early symptoms get progressively worse.
Treatment: Relieve symptoms. Replace fluids.
RR: 50 HT: 1 Week
Notes: Resembles a mild case of influenza. Common disease in horses. Vaccine available. Agent intended to incapacitate.

Viral Pneumonia
Differential Diagnosis: Other pneumonias (not listed).
TRX: Airborne Particles, contact, illnesses.
CTC: 80
IP: (3) Days
Early Symptoms: [5 Days] Cough, fever, sore throat, body pain, fluid-filled lungs.
Advanced Symptoms: [5 Days] All early symptoms continue.
Treatment: Relieve symptoms, rest.
RR: 20 HT: 21 Days

Notes: Viral Pneumonia can sometimes develop (20% chance) after a bout of influenza. Also, the symptoms are duplicated by pneumonic plague (q.v.). This is not a BW weapon, but is included for convenience as a secondary infection following other infections.

Western Equine Encephalitis
Differential Diagnosis: None
TRX: Contact with Insects. Contact with bodily fluids.
CTC: 65
I**P: 5 + (5) Days**
Early Symptoms [4 Days]: Headache, drowsiness, fever, gastro-intestinal disturbances.
Advanced Symptoms [4 Days]: Insomnia, muscle pain, lethargy, mental confusion, disturbance of speech, possible amnesia,
and possible coma.
Treatment: Relieve symptoms. Vaccine (see notes).
RR: 50 HT: 2 Weeks
Notes: Vaccine available. It is an effective therapy at half-effect if given within the first 48 hours following infection, and no effect after that. Agent is intended to incapacitate.

Yellow Fever
Differential Diagnosis: Hepatitis, Jaundice (not listed)
TRX: Contact with insects (Mosquitoes)
CTC: 65
IP: 2 + (4) Days
Early Symptoms [3 Days]: Malaise, headache, fever, pain in eyes, nausea, and vomiting. Also severe body pains, prostration,
bleeding into the skin and from mucous membranes.
Advanced Symptoms [(3) Days]: Slight relief on first day, then all previous symptoms return. Delerium.
Treatment: Relieve Symptoms
RR: 25 HT: 2 Weeks
Notes: Vaccine available. Agent intended to kill.

Rickettsial Agents

Rickettsia are the causes of obscure but still dangerous diseases. The difficulty in diagnosing such diseases makes them attractive to BW researchers because it prevents a targeted enemy from being able to effectively counteract them.

Rickettsia are between viruses and bacteria in size and are structurally similar to bacteria. Rickettsia follow similar life patterns to bacteria. However, Rickettsia do not have an adequate cell membrane and, like viruses, are prone to destruction by drying out.

Psittacosis
Differential Diagnosis: None
TRX: Airborne particles. Contact with bodily fluids. Ingestion.
CTC: 60
IP: (2) Weeks
Early Symptoms [7 days]: Chills, fever, anorexia, sore throat, malaise, headache.
Advanced Symptoms [7 Days]: Continued, but worsening.
Treatment: Antibiotics. Relieve symptoms
RR: 40 HT: 1 Week
Notes: Also called parrot fever. Vaccine available. Agent intended to incapacitate.

Q-Fever
Differential Diagnosis: Psittacosis. Brucellosis. Pneumonia, Hepatititis, Tuberculosis (not listed).
TRX: Caused by a parasite of cattle, sheep and goats. TRX is by airborne particles, ingestion of infected milk, contact with feces.
CTC: 50
IP: (3) Weeks
Early Symptoms [5 Days]: Prostration, muscle pain, abdominal pain, cough, jaundice.
Advanced Symptoms [7 Days]: Continued
Treatment: Antibiotics. Relieve Symptoms.
RR:65 HT: 2 Weeks.
Notes: Vaccine available. Designed to incapacitate.

Rocky Mountain Spotted Fever
Differential Diagnosis: Typhoid, measles (not listed)
TRX: Contact with insects (ticks)
CTC: 50
IP: 3 + (6) Days
Early Symptoms [1 + (5) Days]: Anorexia, malaise, nausea, headache, and sore throat. Progresses to include chills, fever, aches in joints, bones, and muscles.
Advanced Symptoms [7 Days]: Vomiting. Rash. Delerium and stupor possibly progressing to coma.
Treatment: Antibiotics.
RR: 30 HT: 2 Weeks
Notes: Vaccine available. Agent intended to kill.

Epidemic Typhus
Differential Diagnosis: Murine (endemic) Typhus (see notes).
TRX: Body Lice
CTC: 50
IP: 9 + (5) Days
Early Symptoms: [7 Days] Fever, malaise, headache, rash.
Advanced Symptoms: [8 Days] Worse rash, delerium, stupor.
Treatment: Antibiotics, rest.
RR: 20 HT: 7 Days
Notes: Murine Typhus is flea-borne and less severe (RR=35). It is otherwise identical to Epidemic Typhus. Vaccine available. Agent is intended to kill.

Bacterial Agents

Bacterial agents once made up the bulk of BW agents, although much of the focus has now shifted to viral agents. Part of the reason for the shift of focus is the ease of manipulating viruses, but also there is the drawback that most bacterial infections can be treated quite well with modern antibiotics. Nevertheless, bacterial agents remain an important component of BW.

Pulmonary Anthrax
Differential Diagnosis: None
TRX: Airborne Particles
CTC: 75
IP: (5) Days
Early Symptoms: [3 Days] Fever, malaise, labored breathing, cough.
Advanced Symptoms: [5 Days] All early symptoms get progressively worse.
Treatment: Antibiotics.
RR: -10 HT: 5 Days

Notes: Pulmonary Anthrax is common in livestock. It can survive indefinitely in the soil in spore form, although it would require very heavy bombardment for a permanently contaminated anthrax zone to be established. Vaccine available. Agent intended to kill.

Brucellosis
Differential Diagnosis: None.
TRX: Airborne particles. Contact.
CTC: 40
IP: 3(10) Days
Early Symptoms [7 Days]: Chills, fever, weakness with fatigue and exhaustion, severe headache and backache. Night sweats. Abdominal pains.
Advanced Symptoms [14 Days]: Continued, but worsening.
Treatment: Antibiotics.
RR: 30 HT: 1 Week
Notes: Vaccine available. Agent intended to kill.

Cholera
Differential Diagnosis: Baccilary Dysentery
TRX: Contaminated food and water
CTC: 50
IP: (5) Days
Early Symptoms: [2 Days] Diarrhea passing greyish feces, abdominal cramps, vomiting.
Advanced Symptoms: [6+(4) Days] Dehydration, loss of color, clammy skin, shallow breathing, 20% chance of coma.
Treatment: Restore fluids, antibiotics, relieve symptoms, rest.
RR: -5 HT: 14 Days
Notes: Common disease found in unsanitary conditions where food and water may be contaminated by sewage. Vaccine available. Agent intended to kill.

Baccilary Dysentery
Differential Diagnosis: Cholera
TRX: Flies, contaminated food and water, contact with infected feces.
CTC: 80
IP: (3) Days
Early Symptoms: [3 Days] Blood and mucus in feces, fever, chills, abdominal cramps.
Advanced Symptoms: [7 Days] Convulsions, lethargy, anorexia, delerium, 50% chance of coma.
Treatment: Restore fluids, relieve symptoms.
RR: 20 HT: 17 Days
Notes: Dehydration may also result from sweating and diarrhea.

Meningicoccal Meningitis
Differential Diagnosis: None
TRX: Airborne Particles.
CTC: 45
IP: 5 Days
Early Symptoms [4 Days]: High fever, chills, and headache. Pain in the back, abdomen, and extremities. Rash on skin and mucous membranes.
Advanced Symptoms [4 Days]: Confusion and delerium leading to coma. Shock (decreased blood pressure). Muscular spasm. Stiff neck. Exaggerated reflexes. Rash has faded.
Treatment: Antibiotics.
RR: 10 HT: 3 Weeks

Notes: A dangerous infection and inflammation of the meninges, a set of membranes which envelop the brain and spinal column. Vaccine available. Agent intended to kill.

Pneumonic Plague
Differential Diagnosis: Flu, Influenza, various Pneumonias.
TRX: Contact with rat-borne fleas. Pneumonic is spread by airborne particles (see notes).
CTC: 80
IP: (5) Days
Early Symptoms: [5 Days] Fever, swollen lymph nodes, abdominal pain,
Advanced Symptoms: [10 Days] All early symptoms become progressively worse. Also delerium and black rash (rash is for bubonic only--see notes).
Treatment: Antibiotics, relief of symptoms.
RR: -20 HT: 80 Days
Notes: Both the bubonic and pneumonic plague are caused by the same disease organism. The pneumonic form infects the body through the lungs and so the characteristic black rash does not appear. No vaccine available. Agent intended to kill.

Tularemia
Differential Diagnosis: Various pneumonias, cat scratch fever, and menigicoccal and rickettsial infections.
TRX: Airborne particles. Contact.
CTC: Contact with animal tissues. Contact with Insects. Ingestion of contaminated meat or water.
IP: 2(5) Days
Early Symptoms [(3) Days]: Fever, nausea, and headache begin suddenly, with a papule or pimple forming at the point where
the agent contacted the skin. This papule soon ulcerates. If the agent was ingested, there is gastro-intestinal disturbance, stupor, and delerium.
Advanced Symptoms [(6) Days]: Delerium. Prostration. General aches. Lymph nodes become enlarged and tender and start forming pus.
Treatment: Antibiotics.
RR: 10 HT: 2 Weeks
Notes: A common disease among wild rodents (particularly rabbits) which is normally passed on to man through his interactions with the animals. One attack of tularemia generally confers immunity. Vaccine available. Agent intended to kill.

Typhoid Fever (Enteric Fever)
Differential Diagnosis: Viral Pneumonia
TRX: Contaminated food and water.
CTC: 50
IP: 4 + (10) Days
Early Symptoms: [7+(3) Days] Increasing fever, chills, malaise, coughs, vomiting.
Advanced Symptoms: [7+(3) Days] Stabilizing fever, diarrhea, listlessness.
Treatment: Antibiotics, relief of symptoms, rest.
RR: 10 HT: 7+(3) Days
Notes: 1% of those infected can become carriers. These people do not develop the symptoms but are treated as being vectors for disease transmission purposes. Vaccine available. Agent intended to kill.

Fungal/Mycotal Agents

Fungal/Mycotal agents have not been the subject of a great deal of research in the BW field from a disease standpoint. Rather, the focus has been on mycotal toxins, such as trichothecene mycotoxins, a potential component of "Yellow Rain". At present, the United States Army does not

consider fungi themselves as antipersonnel weapons. The Soviet Union and its allies have been alleged to be experimenting with mycotal weapons, but this seems to be a drive for mycotal toxins rather than using the organisms themselves as the weapon. Fungal/Mycotal weapons are not expected to be stockpiled nor used in a future conflict. Vaccines do not exist for fungal/mycotal agents, but the United States is examining the possibility of a trichothecene vaccine.

Coccidioidomycosis
Differential Diagnosis: Any flu-like disease (not listed). Influenza.
TRX: Airborne particles.
CTC: 60
IP: 3(10) Days
Early Symptoms [(2) Days]: Fever and chills, severe pain in lungs, muscular ache, backache, cough, general weakness.
Advanced Symptoms [15 Days]: Prostration. Anorexia. Measle-like rash soon followed by development of painless ring-type patches.
Treatment: Rest. Relieve symptoms. Antibiotics.
RR: 45 HT: 4 Weeks.
Notes: Agent intended to incapacitate

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Chemical Agents Effects Table

	Concentration (CNC):																			
Agent:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**12**	**14**	**16**	**18**	**20**	**25**	**30**	**35**	**40**	**50+**
Riot Control																				
CA	1/-	1/-	1/87	1/25	1/12	1/7	1/4	1/2	1	1	1	2	1*	1*	1*	2*	3*	4*	6*	9*
CN	1/-	1/-	1/-	1/60	1/28	1/17	1/10	1/6	1/4	1/3	1	1	1	1	2	1*	1*	2*	2*	4*
CS	1/-	1/-	1/-	1/-	1/-	1/-	1/76	1/40	1/30	1/20	1/12	1/9	1/7	1/5	1/4	1/3	1	1	1	2
DM	1/-	1/-	1/-	1/-	1/65	1/39	1/24	1/13	1/10	1/7	1/4	1/3	1/2	1	1	1	2	2	1*	3*
DA	1/-	1/-	1/-	1/-	1/66	1/40	1/25	1/13	1/10	1/7	1/4	1/3	1/2	1	1	1	2	2	1*	3*
CN/DM	1/-	1/-	1/-	1/60	1/28	1/17	1/10	1/6	1/4	1/3	1	1	1	1	2	1*	1*	2*	2*	4*
Blood																				
AC	1/-	1/-	1/-	1/79	1/37	1/22	1/14	1/7	1/6	1/4	1/2	1	1	1	1	2	1*	2*	2*	3*
CK	1/-	1/-	1/-	1/35	1/17	1/10	1/6	1/3	1/3	1/2	1	1	2	2	1*	2*	2*	3*	4*	6*
Blister																				

ED	1/-	1/-	1/75	1/21	1/10	1/6	1/3	1	1	1	2	2	1*	2*	2*	2*	4*	5*	7*	1**
L	1/-	1/-	1/38	1/10	1/5	1/3	1	1	1	2	1*	2*	2*	3*	3*	5*	7*	1**	1**	2**
HD or H	1/-	1/-	1/38	1/10	1/5	1/3	1	1	1	2	1*	2*	2*	3*	3*	5*	7*	1**	1**	2**
HN	1/-	1/100	1/25	1/7	1/3	1	1	2	2	1*	2*	2*	3*	4*	5*	7*	1**	1**	2**	3**
CX	1/-	1/100	1/25	1/7	1/3	1	1	2	2	1*	2*	2*	3*	4*	5*	7*	1**	1**	2**	3**
Choking																				
PS	1/-	1/-	1/100	1/29	1/13	1/8	1/5	1/3	1	1	1	2	2	1*	2*	2*	3*	4*	5*	8*
CL	1/-	1/-	1/87	1/25	1/12	1/7	1/4	1/2	1	1	1	2	1*	1*	1*	2*	3*	4*	6*	9*
CG	1/-	1/-	1/80	1/23	1/10	1/6	1/4	1/2	1	1	2	2	1*	2*	2*	2*	3*	5*	6*	9*
Incapacitatant																				
BZ	1/-	1/-	1/-	1/35	1/17	1/10	1/6	1/3	1/3	1/2	1	1	2	2	1*	2*	2*	3*	4*	6*
Blue-X	1/-	1/-	1/75	1/21	1/10	1/6	1/3	1	1	1	2	2	1*	2*	2*	2*	4*	5*	7*	1**
Nerve																				
GA	1/75	1/15	1/4	1	2	1*	2*	3*	4*	7*	1**	2**	2**	3**	3**	5**	7**	10**	13**	20**
GB	1/35	1/7	1	2	2*	2*	4*	7*	1**	1**	2**	3**	4**	6**	7**	10**	15**	21**	29**	43**
GD	1/25	1/5	1	1*	2*	3*	5*	1**	1**	2**	3**	5**	6**	8**	10**	14**	21**	29**	40**	60**
VX	1/5	1	2*	5*	1**	2**	3**	5**	7**	10**	16**	23**	30**	40**	49**	73**	106**	146**	200**	300**
VR-55	1/3	1	1*	3*	7*	1**	2**	3**	4**	7**	11**	16**	20**	27**	33**	49**	71**	98**	133**	200**
Biological Toxins																				
YELLOW RAIN	1/-	1/100	1/25	1/7	1/3	1	1	2	2	1*	2*	2*	3*	4*	5*	7*	1**	1**	2**	3**

WHITE RAIN	1/50	1/10	1/3	1	1*	2*	3*	5*	7*	1**	2**	2**	3**	4**	5**	7**	11**	15**	20**	30**
GREEN RAIN	1/-	1/-	1/75	1/21	1/10	1/6	1/3	1	1	1	2	2	1*	2*	2*	2*	4*	5*	7*	1**

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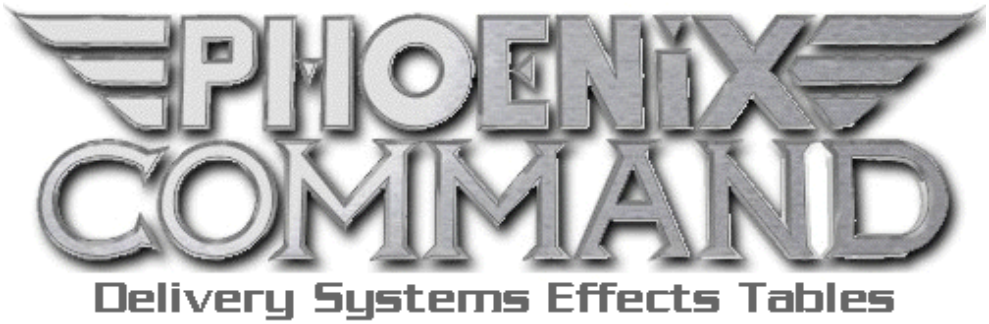

Delivery Systems Effects Table

US 155mm Artillery Shell

Elapsed Time			Wind Speed	CNC															
Pers.	Non-pers.	Rows	on Impact	Range from Burst															
				01	2	3	4	5	6	7	8	9	10	11	12	14	16	20	
Burst			0	25	25	10	7	5	4	4	3	3	3	3	3	2	2	1	
20h	5 p	1	1	25	23	10	7	5	4	4	3	3	3	3	3	2	2	1	
2d	10 p	2	2	23	20	9	6	5	4	4	3	3	3	3	3	2	2	1	
3d	15 p	3	3	20	18	8	6	4	3	3	2	2	2	2	2	2	2	1	
3.5d	20 p	4	4	18	16	7	5	4	3	3	2	2	2	2	2	1	1	1	

4d	25 p	5	5	18	16	7	5	4	3	3	2	2	2	2	2	1	1	1		-
4d	30 p	6	6	15	14	6	4	3	2	2	2	2	2	2	2	1	1	1		-
3.5d	35 p	7	7	13	11	5	4	3	2	2	2	2	2	2	2	1	1	1		-
3d	40 p	8	8	13	11	5	4	3	2	2	2	2	2	2	2	1	1	1		-
3d	45 p	9	9	10	9	4	3	2	2	2	1	1	1	1	1	1	1		-	-
2.5d	50 p	10	10	10	9	4	3	2	2	2	1	1	1	1	1	1		1	-	-
2.5d	55 p	11	12	8	7	3	2	2	1	1	1	1	1	1	1	1	1		-	-
2.5d	60 p	12	14	8	7	3	2	2	1	1	1	1	1	1	1	1	1		-	-
2.5d	65 p	13	16	8	7	3	2	2	1	1	1	1	1	1	1	1	1		-	-
2d	70 p	14	18	5	5	2	1	1	1	1	1	1	1	1	1	-	-	-	-	-
2d	75 p	15	20	5	5	2	1	1	1	1	1	1	1	1	1	-	-	-	-	-
2d	80 p	16	22	5	5	2	1	1	1	1	1	1	1	1	1	-	-	-	-	-
2d	85 p	17	24	5	5	2	1	1	1	1	1	1	1	1	1	-	-	-	-	-
2d	90 p	18	26	3	2	1	1	1		-	-	-	-	-	-	-	-	-	-	-
2d	95 p	19	28	3	2	1	1	1		-	-	-	-	-	-	-	-	-	-	-

2d	100 p	20	30	3	2	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-
1.5d	105 p	21	34	3	2	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-
1.5d	110 p	22	38	3	2	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-
1.5d	115 p	23	42	3	2	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-
1d	120 p	24	46	3	2	1	1	1	-	-	-	-	-	-	-	-	-	-	-	-

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Introduction and Definitions

Phoenix Command Basic Miniatures Rules v.001

Based upon the **Terminator 2: Year of Darkness Miniatures Combat System** published and Copyright 1994 by Leading Edge Games.

Phoenix Command Miniatures v.001

Modern miniatures adventure and military gaming.

Introduction:

Phoenix Command Miniatures is based upon the **Phoenix Command Small Arms Combat System**, published by Leading Edge Games. Although these two games share a certain pedigree, there are some very significant differences.

One of the last products released by Leading Edge Games before the company ceased operations was the **Terminator 2 Year of Darkness Miniatures Game**. This presented a stripped-down Phoenix Command ruleset and matched humans against terminator robots. Similar game mechanics were presented in the **Aliens Boardgame**, which allowed players to battle between miniatures of Colonial Marines and Alien warriors. Though never released, a **Living Steel** miniatures variant code-named "**Blasteroo**" supposedly adopted a similar rules design. The emphasis on these three incarnations of Phoenix Command Miniatures rules was playability and speed. Though not as complex as the flagship Phoenix Command rules, the miniatures rules carried their own flavour, and tried to expose a wider audience to the Leading Edge rules systems.

This latest incarnation of Phoenix Command Miniatures builds upon the foundations of the Aliens, Terminator 2, and Blasteroo rules, while still cleaving to the standards set by the Phoenix Command Small Arms

Combat System.

So, why rewrite a simplified combat system for miniatures?

While Phoenix Command Small Arms Combat System works quite well as a miniatures game, it is at its core a very complex system based completely around small arms ballistics. It is designed for the player who wants the perfect simulation of small arms combat on the tabletop, taking into account every detail. Its modular ruleset allows for easy expandability and modification by allowing new rules to be layered on the core mechanics. The degree of realism offered by Phoenix Command is phenomenal.

Phoenix Command Miniatures, on the other hand, chooses simplicity in an attempt to be more accessible to a wider array of players without sacrificing the degree of realism which is a hallmark of all Phoenix Command games. The Miniatures System allows the players to set up and start playing a game faster, and play through a game faster still.

Additionally, where things happen on the miniatures table very quickly, players can soon find the situation getting away from them if they fail to make sound tactical decisions. Just as in reality, dealing with a rapidly developing tactical situation can be a crucial element in command.

Where the Small Arms Combat System focuses on simulating the decisions of individuals on a battlefield, the Miniatures System instead focuses on the decisions faced by commanders in small unit engagements. Initiative and morale rules take the centre stage here, and commanders must learn to deal with these human factors in shepherding their units towards their objectives.

The Miniatures rules are presented in stages, to allow new players to learn the rules in easily digestible chunks. The first few sections deal with infantry operations, with armor, artillery, and air support being added in later sections. A subsequent rules set will add in special weapons, animals, and other battlefield elements.

Chapter 1. Setup

1.0 Scale and Dice Rolls

Ground scale for 20 to 25mm miniatures is 1 inch equals 2 metres.

One figure model represents a single combatant. One vehicle model represents one vehicle.

All dice rolls require a ten-sided die that will generate a number from 0 to 9. The 0 is read as zero, rather than 10 as is sometimes the practice in other games.

1.1 Definitions

Actions: A combatant performs actions on the battlefield. In the game these actions typically consist of movement, weapons fire, or melee combat. Actions are typically only performed through the use of command points by a combatants fire team, but in certain cases, actions can be performed independently of the use of command points.

Active Combatant: An active combatant is one who is in the midst of battle. In game terms, this means a combatant who:

1. did not perform actions in the Strategic Movement phase (does not include actions performed in interrupts), and
2. is not panicked or incapacitated.

Activation: A unit can be activated once in a turn. An activated unit can either expend accumulated CP by performing actions such as movement or firing, or it can perform no actions and instead accumulate another CP. A unit which chooses to accumulate another CP is assumed to be engaged in planning and coordinating their next move.

Armour PF: Armour Protection Factor. All Armour and Cover has a Protection Factor, which determines whether a weapon can go through the armour to strike the target behind it. If the weapon's PEN exceeds the Armour PF by more than 3, the weapon penetrates and can cause injury to the target. If the PEN is equal to or exceeds the Armour PF by 3 or less, then the weapon glances and has a reduced chance of injury. Finally, if the PEN is less than the Armour PF, the weapon does not penetrate and does not cause damage.

Breveting: When a unit's leader is killed or incapacitated, a new leader is automatically appointed or breveted from the remainder of the unit. The new leader must spend CP to reorganize the unit, and has a CP rating one less than that of the previous leader. If the CP of the newly appointed leader would be 0 or less, then the unit is broken and cannot brevet a new leader. The broken unit must retreat.

Broken Units: A broken unit has been routed through morale failure. The unit members are considered panicked, and must move back to their forming up point during strategic movement.

Combatant: A combatant is a single figure representing a soldier, police officer, or adversary.

Command Check: A Command Check is a die roll to determine whether a unit's leader maintains control over his troops. A 0-9 roll is made for each figure in the unit other than the leader, and the roll is compared to the Command Check Target. The Command Check Target is the sum of the Troop Quality of the Figure and his Leader's Command Rating. If the 0-9 roll is less than or equal to the Command Check Target, the Command Check is successful.

Command Distance: A leader can only exert command and control over troops within a certain distance. As such, only a leader's troops within his command distance can be subject to the leader's expenditure of command points.

Command Points or CP: A unit leader generates command points through time spent planning. Command points allow the leader's combat team to perform actions on the battlefield. Combat teams that are out of command points are considered disorganized.

Command Rating: A measure of a leader's planning and motivation ability. A leader's accumulated CP can never exceed his command rating.

Defence: A unit attacked by an enemy can return fire and engage in defensive combat. By spending 1 CP, the unit can engage in a disciplined defence, which allows it to fire normally. A unit attacked by an enemy but having no CP can only mount a ragged defence, where all weapons fire and combat is done with a –2 penalty, and all weapons are fired at their maximum rate of fire.

Forming Up Point: Also sometimes called a staging area or start line, the Forming Up Point is where one side's units were organized for the current operation.

Hero: A rarity on the battlefield, the hero is a solitary combatant that is able to perform actions without being part of a unit. Unlike **Stragglers**, who have been separated from their unit, heroes were never part of a unit. Heroes may be part of the player's command structure (such as a platoon

or company commander), or they may be independent of the command structure (such as civilians or journalists).

Interrupt: An Interrupt is an opportunity for an opposing unit to stop the performance of another unit's actions. Typical interrupts include ambushes and defensive weapons fire against a unit performing actions. A successful interrupt causes a unit to stop performing actions, and to lose any remaining command points it may have. To be successful, and interrupt must result in a unit's morale becoming Shaken. An interrupt is automatically successful against shaken units performing actions.

Line of Sight or LOS: Quite simply, units which can see each other have a line of sight to each other. The easiest method of determining line of sight is to stretch a piece of string between two enemy units—if an obstacle intersects the string, then the units do not have a line of sight to each other. Players wishing to make LOS determination more authentic can build a periscope to give a figure's-eye view of the battlefield.

Morale: Morale is a measure of a combatant's willingness to take actions on the battlefield. For many combatants, morale can be **Bold** or **Shaken**. In special cases, combatants' morale can also be **Fanatical** or **Panicked**. In general terms, the more concerned that a combatant is with his personal safety, the less he will be able to do on the battlefield. Morale changes throughout the game depending on the danger faced by the combatant, as well as the motivation provided by the combatants' leaders.

PEN: PEN is the ability of a weapon to penetrate armor.

Ragged Fire: Ragged fire is undisciplined and generally ineffective fire. All ragged fire is performed at the weapon's maximum rate of fire and at a -2 penalty.

Stragglers: Stragglers are individuals who have been separated from their unit, or who are the last survivors of their units. They can generate CP themselves (up to a maximum of 1 CP), and they cannot perform offensive actions. In the basic rules, Stragglers are simply removed from play.

Strategic Movement: Strategic Movement is performed by a unit that is not expecting enemy contact. Strategic movement does not require command points, but can be interrupted by an enemy through the use of ambushes, overwatch, and so forth.

Unit: A unit is a group of combatants that is organized under a unit leader.

The unit is defined by its size (a fire team) or role (heavy weapons). Organization charts are provided later in this rulebook showing the composition of units in many modern military and police forces. In the game, units perform actions together.

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Page last modified: December 14, 2001

Phoenix Command Basic Miniatures Rules v.001

2.1 Turn Sequence

The game is played in a series of turns until one side or the other achieves victory on the battlefield.

The turn is broken into the following stages:

Strategic movement

Move any units that are designated for strategic movement—that unit may not act in the operations phase and loses any CP it may have accumulated over prior turns. The unit must not be in contact with the enemy before it engages in strategic movement, and its movement may not bring it into enemy contact. Its movement may, however, be subject to an interrupt if it passes through an ambush or enemy overwatch. Units are in contact if they are in weapons range of each other and are able to draw a Line of Sight to each other.

Resolve any interrupts that occur when units in strategic mode move into contact.

Initiative

Count the number of active combatants on each side. The Side which has the most active combatants has initiative until the turn ends, or an interrupt causes a change in initiative. An active combatant is one who:

1. did not perform actions in the Strategic Movement phase (does not include actions performed in interrupts), and

2. is not panicked or incapacitated.

Operations

The unit on the battlefield with the highest number of CP is activated. It can either:

1. Expend all its CP by performing actions,

2. Accumulate another CP, or

3. Pass by doing nothing.

The decision then passes to the unit with the next highest number of CP, and so forth until all units have been activated.

In the event that both sides have a unit with an equal number of CP, the side with initiative activates their unit first.

Once a unit has been activated in a turn, it cannot become activated again in the turn.

> ***Example:*** *Alex has the initiative and has four fireteams with 3, 2, 2, and 0 CP accumulated, while Jason has two squads with 2 and 1 CP accumulated.*
>
> *The activation of units in the operations phase of a turn would be as follows: Alex activates the fireteam with 3 CP first and adds another CP, giving 4 CP in total. This fireteam has been activated for the turn and cannot be activated again.*
>
> *Because he holds initiative, Alex activates one of the squads with 2 CP and performs actions and then does the same with the other squad with 2 CP. He chooses the order in which these two units are activated.*
>
> *Once Alex has activated all of his units with 2 CP, Jason is able to activate his 2 CP unit. He adds a CP, bringing the unit's accumulated CP to 3. As this unit has been activated once in this turn, it cannot be activated again. Then Jason activates his final unit with 1 CP and has it accumulate another CP.*
>
> *Finally, Alex activates his 0 CP unit and has it accumulate another CP.*
>
> *All units have been activated, and this ends the operations phase of this turn.*

2.2 Unit Organization

Combatants are organized into units on the battlefield. All members of the unit must remain within the **Command Distance** of the unit's leader and must perform their actions at the same time in the turn. When the unit's leader begins expending command points, all members in the unit must act.

Some common unit organizations are found here.

Units cannot be subdivided below the level of fire-team. However, units can be consolidated into larger organizations, such as sections/squads and even up to platoons, so the entire larger organization acts at the same time, and these can be broken down to their constituent units later in the game.

Consolidation:

To consolidate sub-units into a larger unit or organization, all sub-units to be consolidated

must be within the Organization Leader's Command Radius. Consolidation requires 1 CP per sub-unit to be consolidated. Once consolidated, any CP not belonging to the organization Leader are lost.

> ***Example:*** *The US Infantry Squad contains two fire teams/sub-units. To consolidate the units into a single squad, the two fire teams/sub-units must be within the squad leader's command radius, and the Squad leader would have to spend a total 2 CP (one CP for each unit) to complete the consolidation. If the intent were to consolidate to a platoon, all the units would first have to be consolidated into squads, and then the squads consolidated into a platoon.*
>
> *Furthering the example, the Squad leader had 4 CP and the Team Leader of the second fire team had 3 CP, following the consolidation, the Squad leader would have his original CP less 2 for the consolidation leaving (4-2 =) 2 CP, and the team leader of the second fire team would have lost the 3 CP that he had before the consolidation.*

Only units in the same organizational structure can consolidate, so only the two fire teams that comprise the same squad can consolidate, and squads can only consolidate with other squads from their platoon, and so forth.

Detachment:

A consolidated unit can detach units. Doing so costs 1 CP per unit detached. A detached unit begins with no CP.

> ***Example:*** *A US infantry squad breaks itself into two fire teams. Doing so requires 1 CP, and the unit is broken into two units. Only 1 CP was required for the detachment since officially, only one unit was detached*

Reorganization:

In the midst of a battle, as units take casualties and are eliminated, holes may develop in the organizational structure. A platoon leader may want to assign and shift his units in his organization to maintain an effective command structure. Doing so is handled in a similar way to consolidation, but with key differences.

The reorganization requires expenditures of command points from two levels above the units subject to reorganization. So, a Platoon leader would be necessary to give reorganization orders to units under his command, and a company leader would be necessary to give reorganization orders to squads.

> ***Example:*** *Heavy fighting has mauled two of the squads in a platoon, so that each squad has lost a fire team. The Platoon leader is able to expend CP to reorganize the remaining fire teams into a single squad.*
>
> ***Example:*** *Two squads have taken heavy casualties, so that none of their units are up to full strength. The Platoon leader is able to expend CP to reorganize all the individuals in the two squads into new fire teams and bring the new fire teams together into a single squad.*

Reorganization requires the expenditures of 2 CP for each sub-unit affected. In the event that the reorganization results in the elimination of sub-units from the command structure, CP are only expended on the remaining sub-units. As with consolidation, the units being reorganized must be within the Reorganizing leader's Command Distance.

> **Example:** Continuing the examples above, as the reorganization results in the formation of a single squad with two units, only 4 CP are required from the platoon leader. Ordinarily these two squads would each have had two sub-units, but the reorganization eliminated two sub-units.

2.3 Command and Control

Command and Control determines how well a combat unit is able to develop and execute tasks on the battlefield, through a process of planning, initiative, and motivation. In Phoenix Command Miniatures, the Command and Control process is handled through the use of Command Points (CP).

When a unit is activated in the Operations phase of a turn, the leader of the unit may expend all his accumulated CP by having the unit perform actions. The actions a unit can perform are described in the following section.

If the activated unit's leader does not choose to perform any actions and expend his entire accumulated CP, he accumulates another CP. There is a limit to the number of CP a leader can accumulate, and if the leader is already at his maximum for accumulated CP and does not wish to expend them, he does not gain another and the unit completes its turn. A leader cannot accumulate more CP than his **Command Rating**.

> ***Example****: Jason has two units, led by figures with Command Ratings of 4 and 3. Both have accumulated 3 CP at the start of the present turn. Jason decides not to have his first unit expend any actions this turn, so he adds another CP to the unit, bringing its cumulative CP to 4.*
>
> *He also decides not to have the second unit expend actions either. However, since the unit has already accumulated CP equal to its Command Rating of 3, the unit cannot accumulate further CP. The unit does nothing this turn.*

If a unit decides to expend CP by performing actions, all the unit's CP must be expended, leaving the unit with 0 CP when its actions are completed. Any CP not used in performing actions are lost.

> ***Example:*** *Alex activates a unit with 3 CP. He uses 2 CP to advance the unit towards cover and does not wish to perform further actions. The unit's remaining CP is lost.*

Command Ratings: Each leader has a Command Rating, which determines his ability to plan and exercise control over his troops. Some leaders, notably poorly-trained militia, will have CP of 1 or 2. Most line troops have Command Ratings of 3 to 5, while elite troops can have command ratings of 5 or 6. The higher the rating, the more CP a commander can accumulate and have his troops expend all at once.

Breveting: If the leader of a unit is incapacitated or killed, the unit loses all accumulated CP

and has to appoint (“brevet”) a new leader immediately from within its ranks. The new leader must accumulate and spend 1 CP to take command of the unit. In the advanced rules, a nation’s command and control doctrine can raise or lower this CP cost for the new leader to take command.

The new leader has a **Command Rating** one less than his predecessor. If the new leader’s command rating is less than 1, then the unit cannot brevet a new leader and breaks.

While a unit is breveting a new leader, it may not perform other actions, and can only mount a ragged defence.

> ***Example:*** *Alex’s two militia units (Command ratings 2 and 1 respectively) have taken heavy casualties. Leaders for both units have been killed. Alex brevets a new leader for both units as soon as the old leaders are killed. The first unit’s replacement leader has a Command Rating of 1, while the second would have a Command Rating of 0.*
>
> *Since the second unit’s replacement leader has a command rating of less than 1, that unit is unable to brevet a new leader and breaks from the battlefield.*

The next turn, while the second unit is breaking, the first unit’s new leader accumulates 1 CP. The following turn, he expends that CP to take command of the unit and is then able to act normally.

Command Distance: Each leader has a command distance. All figures in his unit must remain within this distance to the leader to be able to properly take and execute orders. In the basic game, all leaders have a Command Distance as shown in the **Leader Table**. Rules for generating different command distances for leaders are found in the advanced rules.

A figure which ending his turn outside of his leader’s command distance is a **Straggler**. In the advanced rules, Stragglers are a dangerous fixture on the battlefield and can disrupt their own side’s actions or even open fire on their own side. Under the basic rules, Stragglers are removed from play in the turn they become stragglers.

> ***Example:*** *Jason’s fireteam has five figures including a leader. After expending actions, two of the figures finish their movement in positions which place them more than 7” and 8” away from their fireteam leader. These figures are Stragglers and are eliminated from play.*

Command Checks: From time to time, a command check will be required to confirm that a commander maintains control over his troops. The command check is performed by making a 0-9 roll and trying to get under the sum of the figure’s **Troop Quality** and the leader’s Command Rating. This sum is referred to as the **Command Check Target**.

Shaken troops suffer a penalty of –2 to their Command Check Target. Panicked troops and Fanatical troops automatically fail command checks.

Leaders are not required to perform command checks on themselves.

> ***Example:*** *Alex has a unit of three figures attempting to perform an*

ambush/interrupt on one of Jason's units. Alex wants the figures to hold fire until Jason's unit is within the kill zone. Alex's figures are militia (troop quality 2) and the leader has a command rating of 3.

Alex makes a 0-9 roll for the two non-leader figures in the team as soon as Jason's unit enters Alex's team's line of sight, rolling a 3 and 0. Both rolls were below the ***Command Check Target*** *5, which was the sum of the Troop Quality of 2 and the Command Rating of 3. Therefore, both figures hold their fire, as does the leader.*

Jason's unit expends another CP to perform another action. Before they do so, Alex rolls the Command Check again, this time rolling a 6 and a 4. One of Alex's figures fails the command check and opens fire on Jason's unit. Having the ambush blown by a nervous soldier, Alex has the rest of his ambush team open fire on Jason's unit. This weapons fire is resolved before Jason's unit begins performing their actions on the current CP.

Tracking Accumulated CP: Players can track accumulated CP through the use of CP chits. In an open game such as those played to introduce new players to the game, CP chits can be placed right on the tabletop beside the leader figure. This has the advantage of allowing players to know at a glance a unit's accumulated CP, but it also shows the opposing player the same information and it allows him to anticipate actions from units with high CP counts. Chits can be anything—pennies, glass gaming stones, or cardboard counters have all been used.

By setting up a blind or screen around a unit roster, CP chits can be placed next to the appropriate unit's roster. Since the unit's roster is hidden from the opponent, an element of the fog of war is introduced, and opposing players are never certain which units will be the next to be activated. This creates a tension-filled game and gives a better simulation of real small unit actions, but it requires players to keep close track of their own units to ensure that CP are accurately assigned.

2.4 Actions

Units can only perform actions by expending accumulated CP. This can only be done during the **Operations Phase** of the game turn when a unit is activated and chooses to perform actions (See section **2.3 Command and Control**). Each figure in the unit must perform his action before the unit's next CP can be expended.

The actions permitted are shown on the following table:

Action Type	Description
Disciplined Fire	Disciplined fire allows a figure to deliver a coordinated and carefully aimed volume of fire at a target. Disciplined fire enables a figure take an additional shot without modification to their odds of hitting.
Advance and Fire	The advance and fire action allows a figure to move their Standard Move as shown on the movement chart, and direct fire at a target.

Double-time Advance	Double-time advance allows a figure to move twice their standard move. A figure doing a double-time advance may only do so once in a turn, and may not fire during the action they performed the double-time advance.

Example: *Jason activates a fireteam with 3 CP and 5 figures and decides to have them perform actions by assaulting a farmhouse. The five figures in the fireteam are Alan, Bob, Chuck, Doug, and Eric (leader).*

The first CP expended is for disciplined fire to suppress any enemy in the farmhouse. Jason has Alan pop a smoke grenade to cover a subsequent advance, while the rest of the fireteam takes 4 shots each with their small arms.

The second CP expended is a double-time advance for the entire unit, which allows each figure in the unit to move twice the figure's standard move. Jason moves the five figures of the fireteam twice their standard move of 6", for total movement of 12" towards the farmhouse. They cannot perform another double-time advance this turn as each figure can only double-time advance once per turn.

The third CP expended has the team close to and enter the farmhouse. Alan and Bob go through the door shooting at targets they find within. Each takes two shots. Chuck and Doug move to cover outside the farmhouse and fire at the windows to suppress any enemy troops within, firing three shots. Eric moves to the corner of the farmhouse to cover approaches from adjacent buildings.

This unit has expended its entire CP and ends its turn. Jason makes a check and confirms that all members of the unit are within Eric's Command Distance so no members have to be eliminated as Stragglers.

Actions are performed by the figures in a unit, and not the unit as a whole. Individual figures in a unit can perform different actions on the expenditure of the same CP. This means that one figure in a unit could be performing a double-time advance, at the same time as another is performing disciplined fire, while others in the unit are advancing and firing, and so forth.

2.5 Interrupts

Often in modern combat, units will set up combat positions to engage an enemy when the enemy moves into a certain area or kill zone. This is referred to as overwatch or ambush, but the result is the same—to prevent the enemy unit from continuing its actions.

Preparing Interrupts: A unit (ambushers) sets an interrupt by expending 1 CP. Once the interrupt is set, the unit ends its turn and holds the CP it expended setting the interrupt in reserve. An "interrupt prep" marker is placed beside the ambusher unit.

When an enemy unit enters an ambusher's LOS, the ambushers have the option of expending the held CP to perform a single action. The entire unit must perform the same action, since there usually is no time to coordinate a complex response to the appearance of an enemy unit.

For clarification, a hidden unit which becomes spotted as a result of performing actions (even another interrupt) is considered to have entered LOS. This means that a hidden unit which

opens fire may be exposing itself to interrupts from enemy units.

While waiting for an enemy to appear, the unit can continue to accumulate CP as normal, but it may not accumulate more CP (including the reserve CP for the interrupt) than the leader's Command Rating.

Even though a unit that has set an interrupt may have multiple accumulated CP, only a single CP may be used in performing the interrupt.

Premature Interrupt Actions: In performing an interrupt, there is a chance that the ambushing unit may choose to perform its interrupt before conditions are optimal. For example, a soldier in the midst of an ambush may get nervous and open fire before the enemy has reached the kill zone.

Each CP the target spends after entering the ambusher's LOS requires a Command Check to be done for each figure under the ambush team leader's control. A successful command check means that the unit holds its fire and can decide when to fire while the target is performing its action. A failed roll means that the figures that failed perform ragged fire on the target before the target begins its action.

> ***Example:*** *Alex has a unit of three figures attempting to perform an ambush/interrupt on one of Jason's units. Alex wants the figures to hold fire until Jason's unit is within the kill zone. Alex's figures are militia (troop quality 2) and the leader has a command rating of 3.*
>
> *Alex makes a 0-9 roll for the two non-leader figures in the team as soon as Jason's unit enters Alex's team's line of sight, rolling a 3 and 0. Both rolls were below the* ***Command Check Target*** *of 5, which was the sum of the Troop Quality of 2 and the Command Rating of 3. Therefore, both figures hold their fire, as does the leader.*
>
> *Jason's unit expends another CP to perform another action. Before they do so, Alex rolls the Command Check again, this time rolling a 6 and a 4. One of Alex's figures fails the command check and opens fire on Jason's unit. Having the ambush blown by a nervous soldier, Alex has the rest of his ambush team open fire on Jason's unit. This weapons fire is resolved before Jason's unit begins performing their actions on the current CP.*
>
> *Alex resolves the fire as follows. The nervous figure performs ragged fire. This means he fires at the maximum rate of fire for his weapon, in this case three shots and all are performed at a –2 penalty. Unlike disciplined fire, the nervous figure cannot take any shots over and above the 3 shot maximum for his weapon.*
>
> *The leader and other figure perform disciplined fire. The leader takes 2 shots, using the 1 shot line on the odds of hitting tables. According to the rules for disciplined fire, a figure may take an additional shot without modification to their odds of hitting. The other figure fires at his maximum rate of fire of three shots and takes an additional shot as allowed under disciplined fire.*

Resolving Interrupts: If an ambusher's actions are sufficient to cause the morale of the unit to become **Shaken**, then the interrupt is successful. The target unit loses its entire remaining

CP and ceases its turn.

An interrupt is automatically successful against units that were already Shaken before the interrupt occurred.

> ***Example:*** *Continuing the above example, Alex's ambushers manage to cause sufficient casualties to Jason's unit to make the latter's morale Shaken. Jason's unit must cease performing actions and loses all remaining CP. Jason has his unit "Take Cover," which costs no CP and has the unit go to ground taking advantage of any cover they can find. This ends the turn for Jason's unit.*

A failed interrupt means that the target unit is able to continue to perform actions normally.

Ragged Interrupts: Often, a unit will not have any CP in reserve to set or perform a prepared interrupt. However, they may still attempt an interrupt against an enemy unit entering their LOS. The procedure for holding fire and resolving interrupts is identical to that of the prepared interrupt except that a unit performing a Ragged Interrupt can only perform ragged fire.

A unit can only attempt one Ragged Interrupt in a turn.

Take Cover: A unit which has been successfully interrupted must cease performing actions and end their turn. As an option, they can "Take Cover" which has the unit as a whole try to locate any cover they can find and make use of it. Each figure can move up to 3" towards the nearest cover, but they cannot advance towards an enemy to do so. If there is no cover within the 3" limit, then the figures go prone.

The unit should be checked for any Stragglers after they have taken cover, and these should be dealt with appropriately. In the basic game, Stragglers are eliminated from play.

A figure that has Taken Cover is able to use the "In Cover" or "Prone" Lines, as appropriate, on the Odds of Hitting Modifiers Table.

Tactical Notes: The interrupt is a devastating tactic that can bring a coordinated enemy plan to a screeching halt if used properly. Interrupts should be set if enemy contact is anticipated. Multiple units can coordinate their actions so that one unit has set an interrupt while the other is advancing and so forth.

A truly successful interrupt may not only cause the target to become Shaken and end its turn, but if sufficient casualties are inflicted, it may also cause the enemy side to lose initiative, allowing the ambushing side to move its units before the enemy can.

> ***Example:*** *Continuing the above example, Jason's unit has been Shaken and has taken three casualties. Alex calls to check initiative and both sides quickly count their active combatants. Jason had 27 active combatants before the ambush and now has 24, while Alex has 26. Alex seizes the initiative from Jason.*
>
> *Jason has an unactivated unit with 3 CP and 2 unactivated units with 2 CP, while Alex has 2 unactivated units with 2 CP each. The next unit to be activated is Jason's 3 CP unit, followed by Alex's 2 CP units followed by Jason's 2 CP units. Before Alex seized the initiative, Jason's 2 CP units would have been activated before Alex's 2 CP units.*

2.6 Weapons Fire

Units can engage in weapons fire during interrupts or by expending actions in the operations phase of the turn. Units which have performed strategic movement in the turn or units which have used the Double-time advance in their action are not eligible to fire.

The Weapons Tables provide information on **Range**, **PEN**, and **System Damage Modifier (SDM)**. Many weapons can strike the target with multiple rounds each time they hit, and these weapons are designated with a value like “2 hits @ 60” in their PEN entry. In this case, this means that the weapon strikes twice at a PEN of 60 for each successful shot. Each of these hits is resolved independently as described further in this section

If the weapon is listed as having **1 Shot/Action**, then it may only fire 1 shot for each Action performed by the shooting figure. A weapon listed as **1 Use** means that the weapon is disposable and can only be fired once before being discarded. Note that a weapon listed as having 1 Shot/Action or 1 Use takes the shooter his entire action to aim and fire. A Shooter, even if willing, cannot use the 2 shot or 3 shot lines on the **Odds of Hitting Tables** with these weapons. Disciplined fire will not give the shooter an extra shot with these weapons.

A firing figure decides what weapon he is going to use (if he has more than one). For figures with multiple weapons, only one weapon may be used per action.

Once the weapon has been chosen, refer to the appropriate section of the **Odds of Hitting Tables**. At this point the firing figure decides how many shots he will take. If he takes one shot, it is assumed to be fairly carefully aimed and its **Odds of Hitting** are higher than if the two shot or three shot lines are chosen. The player cross-indexes this line with the range to the target, and modifies the number by the target’s **Odds of Hitting Modifier**. This gives the final Odds of Hitting.

The player then rolls a 0 to 9 number for each shot being taken by the figure; if the number rolled is less than or equal to the final Odds of Hitting, the target has been hit by that shot.

When determining the target’s Odds of Hitting Modifier, the target is considered **In Cover** if it is in terrain that provides cover (such as rubble or woods) or if there is cover or an obstacle between the shooter and the target. This includes low walls, vehicles, or other objects which do not block the line of sight but which partially obstructs the line of fire. The target is considered Firing Over Cover if it is firing over or around cover to which it is adjacent.

Optional Stray Fire Rule: Where a shooter is firing at a target, and the shooter’s Odds of Hitting are less than zero (0), have the shooter roll 0-9. Take the difference between the shooter’s 0-9 roll, and the odds of hitting, and subtract this from the hit location and injury roll.

> ***Example:*** *One of Jason’s combatants is militia level and is shooting three shots at a target behind cover at 20 inches. The Odds of Hitting are –3 for each of the three shots. Jason rolls a 7, 4, and 8. The target’s hit location and injury rolls would by modified by –10, -7, and –11. Jason rolls a 6, 9, and 3 for the hit location and injury rolls, and these are modified to –4, 2, and –8 respectively. Reading on the table, Jason sees that he has caused a graze to the target.*

Hit Location and Injury for Human Targets: If a human target is hit, the target figure refers

to the Hit Location and Injury Table. Compare the Weapon's PEN with the Armour PF and resolve it as follows:

Weapon Penetration vs. Armour PF	
Weapon PEN exceeds Armour PF by 4 or higher or target is unarmoured. Or Weapon PEN exceeds target's Armour PF of its Body Armour.	Roll on Hit Location and Injury Table using the Overpenetration Column.
Weapon PEN equals Armour PF or exceeds Armour PF by 3 or less. Or Weapon PEN does not exceed target's Armour PF of its Body Armour.	Roll on Hit Location and Injury Table using the Glancing Column.
Weapon PEN does not exceed Armour PF.	No penetration. No effect on target.

Make a 0-9 roll on the appropriate column of the Hit Location and Injury Table to determine the result. Add the Weapons **System Damage Modifier (SDM)** to the roll to determine the final Injury Effect.

Note that if there is intervening cover between the shooter and the target, then the projectile's PEN for non-explosive ammunition is reduced by the PF of any intervening cover through which the projectile passes before striking the target. Explosive weapons detonate on the intervening cover.

A **Graze** result reduces the Morale of a Bold target to Shaken, and a Shaken target to Panicked. It has no effect on Fanatical or Panicked targets.

A **Light Wound** Result requires the target to make a 0-9 roll against his **Knockout Chance**. If less than or equal to the knockout chance is rolled, the target goes unconscious and is incapacitated. If the character remains conscious, he can act normally, but the Morale of a Bold target is reduced to Shaken, and a Shaken target to Panicked. A Light Wound has no effect on the Morale of a Panicked target.

Fanatical targets suffering a light wound that remain conscious must make a second 0-9 roll against their Knockout Chance. If less than or equal to the knockout chance is rolled, the fanatical target immediately becomes panicked.

Incapacitated figures are simply removed from play in the Basic rules. Advanced rules allow for Medics and Recovery.

A **Critical Wound** result means that the Character has been immediately Incapacitated and is removed from play.

Explosive Weapons: Weapons which have a (B) following their PEN have a significant blast effect. This includes Grenades, Grenade Launchers, LAWs and other explosive weapons. All figures near the target may be injured, with injury effects taken from the Explosive Injury Table after cross indexing the weapon's SDM with the figure's range from the blast centre in the appropriate part of the table.

If the explosive weapon misses its target, roll a ten-sided die. The direction the upper corner of the first die points is the direction the explosive warhead deviates. The explosive warhead detonates 4" away from the target in the direction of deviation.

2.7 Melee

To make a Melee attack, a figure must move to where his base is touching the base of his target and declare a Melee attack. The target figure then decides if he wishes to engage in melee or escape.

Assuming the target engages in melee, the attacker rolls a 0-9 number; if the number rolled is less than his Melee Attack Value, the attack hits. Any successful attacks roll on the Hit Location and Injury Table using the appropriate Melee column for unarmoured targets or targets wearing Body Armour.

If the target instead wishes to escape, there is an additional +5 to the attacker's Melee Attack Value. If the target survives this attack, the target can then perform actions normally.

2.8 Morale

Morale effects play a very important role on the modern battlefield, and much of a leader's time is spent bolstering the morale of troops in combat.

All figures on the battlefield fall into certain morale states. For the majority of troops, the morale state starts with **Bold**, where troops behave execute orders normally.

As troops are exposed to the rigours of combat, their morale state can drop to **Shaken**. In this condition, a soldier is hesitant to expose himself to combat and requires encouragement from his leader to do so. In many armies, this encouragement comes from reassurance that his squadmates are still there to support him, and need his support in return. In other armies, leaders have been known to push reluctant soldiers at the point of a gun.

When a figure in a unit becomes shaken, the unit's leader must decide whether to attempt to Rally the shaken figure, or to abandon him.

Rallying: A rally involves performing actions. When a unit decides to perform actions, a leader must first spend 1 accumulated CP to rally all shaken figures in his unit. Failure to spend the CP means that the Shaken figures will not move or perform actions, and can only perform ragged fire. If the leader has no CP, the leader's superior officer can move to join the unit and expend his own CP to rally the unit.

Abandonment: Rallying can become very expensive in terms of CP and time, and a leader may be tempted to abandon a Shaken figure and press on with his plan. Doing so requires a successful command check for each Bold figure in the unit—any that pass the command check are able to execute actions normally. Those that fail will lag behind by 1 CP. As the actions are resolved, check to see whether the abandoned figures become Stragglers.

> ***Example:*** *Alex's fireteam has been badly mauled by fighting, and one of his five team members is Shaken. Alex's leader has 3 CP accumulated and needs to seize a farmhouse before the enemy can consolidate their defences, so he decides to abandon the Shaken team member, telling him to sit tight and that he and the rest of the team will be back presently.*
>
> *Alex makes Command Checks for the rest of the team, and passes with all but one. Deciding to proceed, he expends the first CP and has the leader and the team members who successfully passed the Command Check perform actions. The one team member that failed the command check does not perform any actions on this CP. The Shaken figure also does not perform any actions.*
>
> *On the second CP expended, Alex moves the leader and all unshaken team members and manages to take down the enemy and clear the farmhouse.*
>
> *On his third CP, he moves the leader and unshaken team members so that the Shaken member is still within Command Distance and does not become a Straggler.*

Leader Self-Rally: If the leader of a unit has been Shaken or Panicked, the leader must expend 1 CP composing himself before he can expend any further CP. On completing a self-rally, the leader is returned to a Bold morale state.

Forced Rally: Where a leader is faced with a desperate situation and where he has multiple shaken troops in his unit, he can perform a Forced Rally. This is a very desperate measure and involves the leader killing one of the Shaken troops.

To do a Forced Rally, the unit's leader expends a CP and removes one of the Shaken troops in his unit from play. The remaining Shaken and Panicked troops in his unit and in any friendly units within sight of the execution are immediately restored to Bold morale state.

The leader performing the forced rally then performs a command check at +2 on each figure in his unit. If the majority of his unit (rounded up) passes, the leader can continue expending CP. If, however, the majority of the unit fails the command check, then the leader is removed from play (shot by his own side) and the unit is Broken.

Panic: A special morale state is Panic, where a figure refuses to follow orders and attempts to flee from the battlefield. The panicked figure will retreat at a double-time advance rate of

movement directly away from the enemy towards cover. He will do so even if he has already double-time advanced earlier in the turn.

If the figure reach cover, the figure will instead attempt to surrender, and is removed from play.

A Panicked figure can be rallied and restored to a Bold morale state by the unit's leader expending 1 CP for each panicked figure.

Panicked figures can only use ragged fire.

Fanatics: Fanatics are another special morale state. Fanatics begin the battle in the fanatic state and can never be changed to a Bold or Shaken morale state. They are, however, subject to **Unit Morale Effects** for panic. Once a fanatic has panicked, he cannot be rallied out of his panic, and will attempt to leave the battlefield. If unable to do so, he will not surrender, but instead attack the enemy with the ferocity of a cornered animal. Fanatic figures can only use ragged fire.

Unit Morale Effects: The morale of figures in a unit can have a ripple effect on others in the same unit. If the majority (rounded up) of figures in a unit are Shaken, then the Unit becomes Shaken and the leader must expend a CP to restore the Unit Morale to Bold for the turn. He must then rally, abandon, or force-rally the individual shaken figures with his next CP in order to keep the unit morale from sliding back to Shaken in the next turn.

If the majority (rounded up) of figures in a unit are Panicked, then the unit as a whole is Broken and immediately routs, moving directly away from the enemy towards the nearest cover at a double-time advance rate of movement. They will do so even if they have already double-time advanced earlier in the turn.

If the unit cannot reach cover within its rout, the unit will instead attempt to surrender, and is removed from play.

Once the unit is in cover, the leader must expend a CP to steady the unit to Shaken state, and then expend another CP to steady the unit to Bold state. Then, he must spend CP to rally each individual panicked member in the unit, as described above.

If the leader does not have sufficient CP to expend, then the unit will, during the next strategic movement phase, move back to its Forming Up Point, or off the battlefield. A commanding officer can attempt to rendezvous with the unit as it routs and may use his CP to rally and steady the unit and its members.

2.9 Heroes

A special form of unit is the Hero, who is an individual figure able to move and act independent of any larger unit. Heroes accumulate CP and perform actions in the same way as other, larger units.

In the advanced rules, heroes can have special abilities which they can use themselves, or to affect a larger unit. In the basic game, however, the heroes have no special abilities and act in the same way as other, larger units with the sole exception of being immune to command distance requirements. They do not have to be within command distance of any other unit,

and can act and move independent of other units.

2.X Design and Tactical Notes

Phoenix Command Miniatures is designed to simulate the decisions faced by small unit commanders, and as such, morale and command and control are key factors, and are reflected in the rules as well.

A small unit commander is essentially trying to impose his will upon an innately chaotic and terrifying situation, and so has to deal with assessing a situation, planning a response, delivering instructions to his people, and then ensuring that his people carry through on those instructions. And all of this is done while the other side is actively trying to kill him and his people. And with the pace of modern combat increasing with the presence of computerized communications, increased coordination of air, ground, and artillery assets, and the growing prevalence of close quarter battle (CQB) and military operations on urban terrain (MOUT), any small unit commander can be quickly overwhelmed by the situation.

Phoenix Command Miniatures simulates a commander's activities through the use of CP. Where in real life units have to stop, assess, plan, and coordinate actions before they can execute operations, in Phoenix Command Miniatures, units have to accumulate sufficient CP before they can act.

This results in a miniatures battle that ebbs and flows as real battles do. Units will spend brief moments acting and racing towards their objectives, and then in the lulls spend time coordinating and planning.

The key to victory is planning. Commanders have to look beyond the next turn, and have to gain an understanding of what their unit will be doing all the way to the end of the battle. Instead of focussing on the next turn, instead focus ten or twenty turns ahead. Players have to manoeuvre units carefully into position for coordinated assaults, or staged defences.

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Tables

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Troop Quality Table			
	Militia	**Professional**	**Elite**
Base Troop Quality	**1**	**3**	**5**
Operational Move	4	5	5
Strategic Move	12	15	15
Hide/Hunt	2	4	5
Melee	0	2	4
Knockout	4	2	0

Odds of Hitting Modifiers			
In the Open	+2	0	-2
In Cover	0	-2	-3
Firing Over Cover	0	-3	-4
Firing from a Bunker	-2	-4	-5

Leader Table		
Quality	**Command Rating**	**Command Distance**
Militia	2	6
Professional	3	6
Elite	5	8

Odds of Hitting									
Skill Rating & Number of Shots	Range **2**	**5**	**10**	**20**	**40**	**70**	**150**	**300**	**600**
MILITIA									
One shot	10	8	5	2	0	0	-2	-4	-5
Two shots	7	3	0	0	-2	-3	-5	-7	-8
Three shots	2	0	-1	-3	-4	-6	-7	-9	-11

PROFESSI ONAL									
One shot	12	10	8	6	3	1	0	-2	-3
Two shots	9	8	4	1	0	-1	-3	-4	-6
Three shots	8	4	1	0	-1	-3	-5	-6	-8
ELITE									
One shot	14	12	10	9	8	4	1	0	-1
Two shots	12	10	9	6	4	1	0	-1	-3
Three shots	10	9	6	2	1	0	-2	-3	-5

Hit Location and Injury Table				
Wound level	**Overpenetration**	Glance	**Melee (Unarmoured)**	**Melee (Armoured)**
Graze	0-1	0-4	0-2	0-4
Light	2	5-6	4-7	5-8
Critical	3-9	7-9	8-9	9

Explosive Injury Table			
	In the Open	**Behind Partial Cover**	**Behind Solid Cover**
	Range from Burst	**Range from Burst**	**Range from Burst**

Blast SDM	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
+1	G	G	G	-	-	G	G	-	-	-	-	-	-	-	-
+2	L	G	G	G	G	G	G	G	G	-	-	-	-	-	-
+3	L	L	G	G	G	L	G	G	G	G	-	-	-	-	-
+4	C	L	G	G	G	L	G	G	G	G	-	-	-	-	-
+5	C	L	L	G	G	L	L	G	G	G	-	-	-	-	-
+6	C	L	L	G	G	C	L	G	G	G	G	-	-	-	-
+7	C	L	L	L	G	C	L	G	G	G	G	-	-	-	-

G = Graze

L=Light Wound

C=Critical Wound

Weapon Data Tables

Weapon	ROF	Range	PEN	SDM
Civilian Weapons				
Carbine	*	100	7	0
Bolt Action Rifle	1 Shot/Turn	400	21	0
Shotgun	*	70	7	+1
Conventional Military Weapons				
Submachinegun	*	300	2 Hits @ 10	0

Assault Rifle	*	300	2 Hits @ 17	0
SAW	*	300	2 Hits @ 21	0
GMPG	*	300	2 Hits @ 27	0
HMG	*	600	2 Hits @ 56	+1
Grenade Launcher	1 Shot/Turn	200	106 (B)	+2
LAW	1 Use	650	2500 (B)	+5
RPG	1 Shot/Turn	500	2600 (B)	+5
Hand Grenade	1 Use	10	36 (B)	+2

Body Armour and Cover PF Table	
Armour Type	PF
Body Armour (Military)	
M69 Body Armour (U.S. Vietnam)	5
Variable Body Armour (U.S. Vietnam)	5
With Medium Plates	10
With Heavy Plates	26
PAGST (U.S. Modern)	6
Russian Ballistic Armour (Russian Modern)	6
With Titanium Plates	13

Body Armour (Military)

Class I Kevlar Body Armour/with ceramic inserts	4/10
Class II Kevlar Body Armour/with ceramic inserts	6/16
Class III Kevlar Riot Armour/with ceramic inserts	9/30
Cover	
Automobile Door	2
Exterior Wood Door	2
Metal Fire Door	6
Brick Wall	370
Cinder Block Wall	4
Cinder Block Wall – Earth Filled	25
Cinder Block Wall – Concrete Filled	460
Interior Wall – Sheetrock/Gypsum/Plaster	1
Wood Frame Wall	1
Log Timber Wall	22
Furniture	1
55 Gallon Drum – Water filled	8
55 Gallon Drum – Earth filled	85
55 Gallon Drum – Concrete filled	3200

Woods (per 10 hexes)	
Light	1
Medium	4
Heavy	17

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Modern Russian Infantry

Table of Organization & Equipment:

Phoenix Command Miniatures Motor Rifle Squad Organization:

Unit 1	**Weapon**	**Troop Quality**
Squad Leader*	Assault Rifle	**Professional**
Machine Gunner	SAW	
Rifleman	Assault Rifle	

Unit 2	**Weapon**	**Troop Quality**
Team Leader*	Assault Rifle/GL	**Professional**
Rifleman	Assault Rifle	
RPG Gunner	Assault Rifle/RPG	

Unit 2	**Weapon**	**Troop Quality**
Team Leader*	Assault Rifle/GL	**Professional**
Machine Gunner	SAW	
Rifleman	Assault Rifle	

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